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CONTENTS

SECOND GRADE.

Development of Numbers from 11 to 20,	5
Primary Combinations, Addition and Subtraction,	16
United States Money,	19
Numbers from 20–100,	20
Multiplication by Twos,	30
Multiplication by Threes,	34
Multiplication by Fours,	38
Multiplication by Fives,	42
Addition, Sum more than 10,	47
Subtraction, with Reduction,	49
Division, and Proof,	61
Multiplication, with Proof,	82
Drill Exercises,	14, 16, 17, 26, 50, 60, 70
Script,	6, 9, 11, 15, 27, 33, 45, 54, 59, 66, 71

THIRD GRADE.

Multiplication, 6's to 12's,	95
Notation and Numeration,	121
Addition,	126
Subtraction,	139
Making Change,	148
Multiplication,	151
Division,	162
Linear Measure,	178
Avoirdupois Weight,	180
Drills,	120, 134, 140, 138

FOURTH GRADE.

Notation to One Billion,	191
Bills,	195
Addition,	204
Subtraction,	208
Multiplication,	212
Square Measure,	217
Division,	219
Cubic Measure,	222
Fractions,	228
Cancellation,	229
Interest,	245
Appendix,	252

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PREFACE.

It has been the aim to present as much of arithmetic in this book as is taught in the best schools during the second, third and fourth grades, or years.

It is presumed that pupils have had oral instruction in numbers from 1 to 10, inclusive, and that they can read in the Second Reader.

Oral exercises will be found on the left hand page and written on the right, with a few exceptions, which are indicated either by a head line or by the nature of the exercises. This arrangement, practically, affords two parallel courses in numbers for the above mentioned grades.

It is believed that teachers will welcome a book that contains carefully graded and varied exercises in numbers for pupils of the second, third and fourth grades, and that parents will appreciate a means that will diminish the task of copying from the board, which consumes the time of children only to induce bad habits of penmanship, and often at the risk of injury to sight.

General statements and formal rules are omitted; definitions have been placed in an appendix for those who may desire them.

SUGGESTIONS TO TEACHERS.

It is confidently believed that the following suggestions, if carried out in the spirit of the true teacher, will be helpful in making this book a means of better elementary instruction:

1. As far as possible, lead the child to discover the facts of numbers for himself.

2. Objects, as beans, nails, etc., are indispensable as a means of *inducing thought* in connection with numbers.

3. *First*, a clear conception of the facts of numbers; *then*, repeated systematic drill to familiarize them.

4. "Make haste slowly." Children acquire *very slowly* ideas of numbers and processes.

5. A child takes delight in *doing* what he is able to *do well.*

6. Cultivate a *habit* of self-reliance and clear expression.

7. The child should read understandingly every question before he attempts to answer it

8. Solutions of questions to be prepared on slate or paper, should be expressed briefly and by proper signs. Thus, question 1, page 10: 14 cents — 10 cents = 4 cents.

9. Insist upon *neatness*, ACCURACY, and *rapidity.*

10. Develop the numbers from 11 to 20, inclusive, after the method indicated in Lessons I and II. Continue the method on the multiplication table, as illustrated on page 97, by the first four sets of factors.

11. Much depends upon the eye to *see* results *promptly*, in order to secure rapidity. Besides those exercises in naming results at sight, given in the book, others should be written on the board.

12. Recur *frequently* to the drill exercises, using them only a few minutes at a time. Thoughtful repetition on different days is a great help to memory.

13. Children become interested in making their own problems. Let some abstract examples be assigned for the children to change to concrete problems; as, for instance, the numbers in example 1, page 47. The pupil may say, Charles has 26c., Henry has 44c., and Tom has 17c. How much money have they?

SECOND GRADE.

LESSON I.

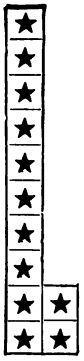
1. How many stars in the column?
2. How many stars are ten stars and one star?
   PUPIL. Ten stars and one star are eleven stars.
3. If I have eleven stars and take away one star, how many stars will be left?
4. Ten sticks and one stick are how many sticks?
5. Eleven pens less one pen are how many pens?
6. Ten pencils and how many pencils are eleven pencils?
7. I have ten cents, and mother gave me enough money to make eleven cents; how many cents did she give me?
8. Ten marks and how many marks make eleven marks?
9. Ten and how many are eleven?

   This number stands for eleven: 11.
10. 10 days and how many days are 11 days?

1. How many pears and 8 pears are 11 pears?
2. 11 boys less how many boys are 6 boys?
3. How many marks and 9 marks are 11 marks?
4. How many more are 11 than 9? Than 5? 7?
5. How many less than 11 are 6? Are 4? 8? 10?
6. What is the difference between 11 and 3? 7 and 11? 11 and 1? 5 and 11? 11 and 10? 1 and 11?
7. How many are 2 and 5 and 4?
8. What other three numbers equal 11?
9. Of the number, 11, which 1 stands for ten?
10. What does the other 1 stand for?
11. 8 + 3 = 11, is read 8 plus 3 equals 11, and means the sum of 8 and 3 is 11.
12. 11 − 5 = 6, is read 11 less 5 equals 6, and means 11 less 5 is 6.

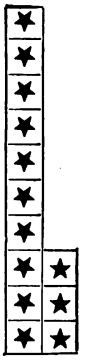
COPY AND COMPLETE.

1. 10 + 1 = ?
2. 11 − 1 = ?
3. 8 + ? = 11
4. 6 + ? = 10
5. ? + ? = 11
6. 10 = ? − 1
7. 11 = ? − ?
8. 11 + 0 = ?
9. 2 + ? = 11
10. 9 + ? = 11



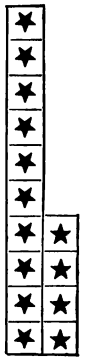
10 + 2

12.



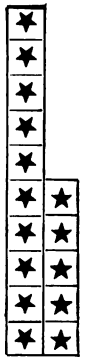
10 + 3

13.



10 + 4

14.



10 + 5

15.

1. If we have one column of ten stars and two single stars, we say twelve stars.
2. How many chairs are ten chairs and 2 chairs?
3. I have two cents, and father gave enough to make 12; how many cents did he give me?
4. How many are ten stars and three stars?
5. How many and twelve equal thirteen?
6. 10 and how many are 13? 13 less 3 are how many?
7. Make 10 marks and 3 marks. How many marks have you?
8. How many are ten stars and four stars?
9. Make 13 marks and one more. How many marks have you?
10. Ten stars and how many stars are 15 stars?

1. Harry has 4 marbles in one pocket and 3 marbles in another. How many marbles has he in both pockets?
2. How many pens are 10 pens and 1 pen? 11 less 1?
3. Lucy has 9 blocks and Jane has 2 blocks. How many blocks have both? Who has an example for 9 and 3?
4. There are 12 books on the table. 3 are open; how many are not open?
5. A hat-tree has 11 hooks, and all the hooks have hats on them except 4. How many hats on the tree?
6. 8 hens and 4 ducks are how many fowls?
7. There are 12 pictures in two books. One book has 7 pictures; how many pictures in the other book?
8. John had 10 cents, and his mother gave him 3 cents more. How many cents did he have then? How many are 10 and 3?
9. There are 6 windows in one room and 7 windows in another room. How many windows in both rooms?
10. 9 forks and 4 knives are how many things?
11. Tom sold 11 papers, and his brother sold 2 more than he did. How many did his *brother* sell?

COPY NEATLY AND COMPLETE.

1. 10 stars and 1 star are.....
2. 12 boys less 2 boys are.....
3. 10 keys and 3 keys are.....
4. 14 marks less 4 marks are.....
5. 10 balls and 5 balls are.....
6. 15 cents less five cents are.....

7. $10 + 2 = ?$
8. $? + 10 = 14$
9. $10 + ? = 13$
10. $? + ? = 15$
11. $15 - 4 = ?$
12. $8 + ? = 13$
13. $9 + 5 = ?$
14. $12 - 8 = ?$
15. $? + 9 = 12$
16. $? + ? = 13$
17. $14 - 5 = ?$
18. $? - 7 = 7$
19. $6 + ? = 14$
20. $15 = ? + ?$

1. Arthur had 14 cents. He bought a copy-book for 10 cents. How many cents had he left?
2. James found 14 eggs. He broke half of them. How many did he not break?
3. There are 14 chairs on the floor, and 1 chair is on the platform. How many chairs in all? 14 and 1 are how many?
4. 15 cents less 10 cents are how many cents?
5. How many 5's in 10? In 15?
6. John has 7 marbles, Tom has 4 marbles, and James has 3 marbles. How many marbles do they all have?
7. Mr. Barr had 9 dollars, and he earned enough to make 14 dollars. How many dollars did he earn?
8. A baker had 15 loaves in his basket. He sold 8 loaves. How many had he left?
9. 13 birds sat on a fence. All but 5 flew away. How many flew away?
10. A lady has 14 fowls. Half of them are hens, and half of them are ducks. How many hens has she?
11. Mr. Crane has 13 fishes. 4 are shad, 3 are bass, and the rest are eels. How many eels has he?
12. 2 and 5 and how many are 11?

COPY AND FIND THE SUMS.

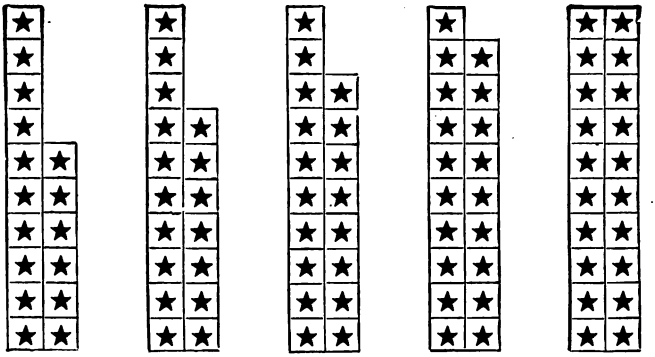
1.	2.	3.	4.
5 spools	7 nails	6 rakes	8 flags
6 spools	5 nails	7 rakes	6 flags

5.	6.	7.	8.
4 corks	9 spades	5 beans	8 peas
5 corks	3 spades	8 beans	4 peas
3 corks	2 spades	2 beans	3 peas

COPY AND FIND THE DIFFERENCES.

1.	2.	3.	4.
13 boxes	15 cents	14 cows	12 pigs
7 boxes	9 cents	8 cows	5 pigs

5.	6.	7.	8.
11 buds	14 dolls	13 pins	15 nuts
6 buds	9 dolls	4 pins	7 nuts



10 + 6	10 + 7	10 + 8	10 + 9	Two 10's
16.	17.	18.	19.	20.

1. How many stars are 10 stars and 6 stars?
2. 15 and 1 are how many? 16 less 1 equal what number?
3. 10 balls and 6 balls equal what? 16 less 6 equal what number?
4. Make 10 marks on the board. How many more must you make to have 16 marks?
5. If I have 16 stars and add 1 star to them how many will I then have? 10 and 7 equal what number?
6. Write, in figures, seventeen, sixteen, fifteen.
7. How many more are 17 stars than 15 stars? How many more are 17 than 13?
8. 17 stars and 1 star are how many stars?
9. How many are 10 stars and 9 stars?

1. There are 10 stars in one column, and 10 stars in another column. How many times 10 stars are there in the two columns?
2. Two tens are twenty.
3. Make 10, 21, 12, 13, 14, 15 on your slates.
4. Make 16, 17, 18, 19, 20 on your slates.
5. Which of the figures in 10 shows how many tens? Which that there are no ones or units?
6. Write the figures that stand for seven ones, three ones, nine units, five units, six units.
7. Write the figures that stand for one ten, two tens.
8. How many blocks are 15 blocks and 1 block?
9. How many desks are 15 desks and 2 desks? 17 less 2? 17 less 3?
10. How many cents are 15 cents and 3 cents? 18 less 2? 18 less 3?
11. How many tubs are 15 tubs and 4 tubs? 19 less 4? 19 less 3?
12. How many bolts are 15 bolts and 5 bolts? 20 less 5? 20 less 4?
13. How many fives in 10? How many twos in 10?
14. How many tens in 20? How many fives in 20?

1. 16 dolls and 4 dolls?
2. 10 pens and 5 pens?
3. 11 pins and 8 pins?
4. 12 cats and 4 cats?
5. 17 a's and 2 a's?
6. 13 cars and 6 cars?
7. 14 hens and 5 hens?
8. 15 dots and 4 dots?
9. 18 bugs and 2 bugs?
10. 19 balls and 1 ball?
11. 7 paws and 7 paws?
12. 8 feet and 8 feet?
13. 9 dogs and 9 dogs?
14. 18 dolls less 5 dolls?
15. 19 pens less 4 pens?
16. 16 pins less 6 pins?
17. 15 cats less 3 cats?
18. 17 a's less 6 a's?
19. 20 cars less 9 cars?
20. 12 hens less 2 hens?
21. 14 dots less 5 dots?
22. 13 dots less 7 dots?
23. 11 balls less 6 balls?
24. 15 cups less 8 cups?
25. 18 feet less 8 feet?

1. $13 + ? = 20$
2. $? + 16 = 19$
3. $20 - ? = 12$
4. $? - 7 = 9$
5. $18 = ? - 2$
6. $16 = ? + ?$
7. $? + 5 = 14$
8. $8 + ? = 17$
9. $10 = ? + ?$
10. $? - 4 = 13$
11. $19 - ? = 15$
12. $3 + 12 = ?$
13. $? + ? = 8$
14. $7 + 2 + 4 = ?$
15. $5 + 4 + ? = 12$
16. $6 + ? + 3 = 11$
17. $10 + 5 - 3 = ?$
18. $15 - 5 + 7 = ?$
19. $20 - 4 - 5 = ?$
20. $8 + ? + ? = 15$
21. $? + ? + ? = 20$
22. $19 - ? - ? = 0$
23. $0 + 17 - 3 = ?$
24. Two 5's $+ ? = 13$
25. Two 10s' $- 4 = ?$

COPY AND FIND THE SUMS.

1.	2.	3.	4.	5.	6.	7.	8.
3	2	6	4	9	7	5	8
2	5	8	6	9	3	4	7

9.	10.	11.	12.	13.	14.	15.	16.
5	2	8	4	9	6	3	7
6	9	3	7	1	8	6	4
4	8	7	6	9	5	8	3

COPY AND FIND THE DIFFERENCES.

17.	18.	19.	20.	21.	22.	23.
15	16	17	18	19	20	14
9	8	7	6	5	4	3

24.	25.	26.	27.	28.	29.	30.
20	19	18	17	16	15	14
6	9	7	9	5	7	8

ADDITION.

On this and the following page are given the forty-five primary combinations in addition and the inverse processes in subtraction. These should be written on the board in various ways and the pupils thoroughly drilled in them.

	a	b	c	d	e	f	g	h	i
	1	2	3	4	5	6	7	8	9
1.	1	1	1	1	1	1	1	1	1
	2	3	4	5	6	7	8	9	3
2.	2	2	2	2	2	2	2	2	3
	4	5	6	7	8	9	4	5	6
3.	3	3	3	3	3	3	4	4	4
	7	8	9	5	6	7	8	9	6
4.	4	4	4	5	5	5	5	5	6
	7	8	9	7	8	9	8	9	9
5.	6	6	6	7	7	7	8	8	9

These primary combinations may be written on the board as follows: 1+1=? 2−1=? 2+1 or 1+2=? 3−1 or 3−2=? etc. The digits may also be written in a column and the number to be added to each digit placed above or at the side of the column.

SUBTRACTION.

	a	b	c	d	e	f	g	h	i
	2	3	4	5	6	7	8	9	10
1.	1	1	1	1	1	1	1	1	1
	3	4	5	6	7	8	9	10	11
2.	2	2	2	2	2	2	2	2	2
	4	5	6	7	8	9	10	11	12
3.	3	3	3	3	3	3	3	3	3
	5	6	7	8	9	10	11	12	13
4.	4	4	4	4	4	4	4	4	4
	6	7	8	9	10	11	12	13	14
5.	5	5	5	5	5	5	5	5	5
	7	8	9	10	11	12	13	14	15
6.	6	6	6	6	6	6	6	6	6
	8	9	10	11	12	13	14	15	16
7.	7	7	7	7	7	7	7	7	7
	9	10	11	12	13	14	15	16	17
8.	8	8	8	8	8	8	8	8	8
	10	11	12	13	14	15	16	17	18
9.	9	9	9	9	9	9	9	9	9

1. Of a class of 12 pupils, 5 had poor lessons. How many had good lessons?
2. Six boots are how many pairs of boots?
3. I bought oranges for 5 dollars and lemons for 4 dollars. What did both cost?
4. Mrs. Todd ordered a barrel of flour at 6 dollars and a barrel of apples at 3 dollars. Find the cost of both.
5. If I have 10 cents and buy a two-cent stamp, how much money have I left?
6. I earned 15 cents. How many cents more make 20 cents?
7. How many cents are 15 cents less 8 cents?
8. Edna is 7 years old? In how many years will she be 16 years old?
9. Jane has 18 cents and May has 2 cents. How many cents have both? Jane has how many cents more than May?
10. My copy book has 20 pages. I have written 6 pages. How many pages have I not written?
11. Mother sent me to the store with 15 cents to buy a funnel worth 12 cents. How much change should I bring back?
12. If I have 14 cents and spend 8 cents, how many cents are left?

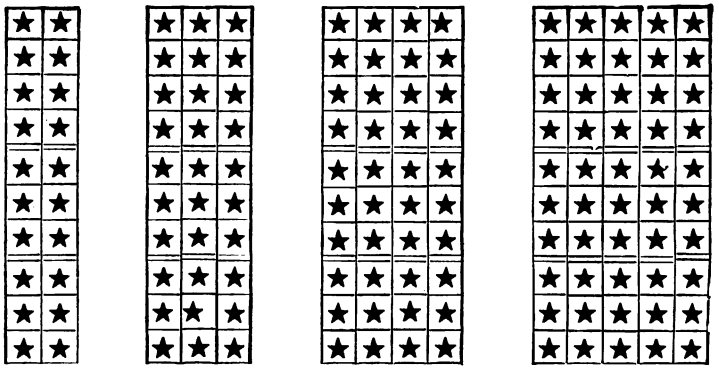
UNITED STATES MONEY.

10 mills (m.)	= 1 cent (ct.)	1 dollar	= 10 dimes
10 cents	= 1 dime (d.)	1 dime	= 10 cents
10 dimes	= 1 dollar ($)	1 cent	= 10 mills

NOTE.—Show the pupils the coins named, and tell them how they may be distinguished. Show them a few bank notes, and instruct them how to distinguish the different denominations.

This sign, $, is called the dollar sign; it stands for dollar, or dollars, and is placed before the figures. Thus, $1 is read one dollar; $3 is read three dollars.

1. A coat cost $13 and a vest $4. How many dollars did both cost?
2. Harry paid 15 cents for his marble and I paid 4 cents less for mine. How many cents did I pay for mine?
3. Ralph earned $8 and George $9. How many dollars did they both earn?
4. Jennie found 6 eggs and Eva found 7 more than Jennie. How many did Eva find?
5. James has a street car ticket for 11 rides. He has used 5 rides. How many more rides is it good for?
6. How many dollars are $5 and $9?



Two 10's 20. Three 10's 30. Four 10's 40. Five 10's 50.

1. Write the figures that stand for twenty.
2. Which of the figures in 20 stands for the number of tens?
3. How can the figure 3 be made to stand for 3 tens?
4. Write the figures that show 3 tens, 4 tens, 5 tens, 6 tens, 7 tens, 8 tens, 9 tens.
5. How many tens are 9 tens and 1 ten?
6. Ten 10's equal one hundred, and in figures one hundred is written 100.
7. Which of the figures in 100 shows the number of hundreds? Which shows that there are no tens? Which shows that there are no ones or units?

1. Write the figures that express 2 hundred, 3 hundred, 4 hundred, 5 hundred, 6 hundred, 7 hundred, 8 hundred, 9 hundred.
2. How many hundred are 9 hundred and 1 hundred?
3. 10 hundred equal one thousand, and in figures one thousand is written 1000.
4. If a figure stands in ten's place, that is, in the second place from the right, what does it show? What does it show if in the third place from the right?
5. In which place must a figure stand to show thousands?
6. Write 1 thousand, 2 thousand, 3 thousand, 4 thousand, 5 thousand, 6 thousand, 7 thousand, 8 thousand, 9 thousand.
7. When 2 stands alone how many units does it express?
8. What is written at the right of 2 to make it express twenty?
9. Express 2 tens and 1 unit, or twenty-one.
10. Write neatly, in a column, the numbers from 21 to 50.
11. Write the numbers from 51 to 100.
12. Write one hundred ten, one hundred twenty.
13. Write the numbers from 101 to 120.

1. 10 and 10 and 10 are how many? Three 10's equal what?
2. If you have 3 strings with 10 buttons on each string, how many buttons have you?
3. How many 10's can be taken from 40?
4. How many 10's in 60? in 70? in 80?
5. Four dimes are how many cents?
6. How many cents in a half dollar?
7. How many cents are 5 dimes? How many 10's in 50?
8. If a man works 10 hours a day, how many hours will he work in six days?
9. How many must be added to 32 to make the sum equal to 40? to 42? to 52? to 45?
10. How many more are 27 than 23? How many less are 23 than 27? In the same way compare:
11. 4 and 12, 6 and 15, 7 and 14, 9 and 17.
12. 12 and 18, 15 and 21, 17 and 26, 20 and 32.
13. 25 and 35, 29 and 37, 35 and 50, 40 and 55
14. 43 and 57, 48 and 60, 56 and 59, 64 and 72.
15. 68 and 75, 73 and 80, 77 and 85, 79 and 88.
16. 81 and 88, 85 and 94, 86 and 95, 88 and 99.
17. 88 and 100, 90 and 96, 92 and 100, 94 and 100.

AT SIGHT NAME THE SUM, THEN THE DIFFERENCE.

25	32	47	51	63	78	84	96
8	9	7	2	6	5	3	4

1. Andrew had 23 cents and his father gave him 35 cents more. How many cents had he then?
2. A lady had $55; she spent $33 in the store. How much money had she left?
3. Helen paid 45 cents for muslin, 22 cents for ribbon and 10 cents for needles. How many cents did she spend for all?
4. In a field are 17 sheep, 20 cows, and 12 calves. How many animals in the field?
5. It is 17 miles from Chicago to Hinsdale and 20 miles from Hinsdale to Aurora. How many miles from Chicago to Aurora?
6. I spent $32 for groceries, $42 for dry goods, and $13 for fruits. How much did I spend in all?
7. There are 97 birds in two flocks; one flock contains 64. How many birds in the other?
8. Mr. Dunn bought a sleigh for $36 and sold it for $47. How many dollars did he gain?
9. I owe $88. If I pay $45, how much do I still owe?
10. Charles is 24 years younger than his father. How old will Charles be when his father is 69 years old?
11. How many are $42, $35 and $51?

1. Nellie is 16 years old. How old was she 7 years ago? How old will she be in 9 years?
2. Yesterday Henry found 17 eggs, and to-day 5 eggs less. How many eggs did he find to-day?
3. 51 gallons of oil were put into a barrel, but 11 gallons leaked out. How many gallons remained?
4. John had 65 cents, but he spent all but 5 cents. How many cents did he spend?
5. Arthur paid $14 for a coat and $11 less for a hat. How many dollars did he pay for the hat?
6. Peter had $100 and his father gave him $15. How much money did he then have?
7. There are 80 days of school in one term. If Louis stays out of school 7 days, how many days does he attend school that term?
8. Frank had 52 marbles and he bought a half a dozen more. How many marbles did he have then?
9. Fred has 68 cents in his bank and 6 cents in his pocket. How many cents has he?
10. I paid 35 cents for meat, 10 cents for a yard of muslin, and 6 cents for stamps. What was the amount I paid for all?

1. A boy selling papers made 23 cents on Monday, 10 cents on Tuesday, 21 cents on Wednesday, 12 cents on Thursday, 21 cents on Friday, and 32 cents on Saturday. How many cents did he make that week?
2. Bought a coat for $13, a vest for $4, pants for $10, and an overcoat for $32. What did the whole cost?
3. Five freight trains passed by; the first had 23 cars; the second, 31; the third, 45; the fourth, 60; the fifth, 70. How many cars in all?
4. What is the weight of 4 bags of wheat weighing 123 pounds, 120 pounds, 130 pounds, and 116 pounds?
5. The length of one block of houses is 220 yards; of another, 203; of a third, 225; of a fourth, 230; and of a fifth, 200. What is the entire length of these five blocks?
6. A boy earned 10 cents an hour for 6 hours' work, on Saturday. How many cents did he receive?
7. A butcher purchased two droves of sheep, one containing 446 sheep, and the other 223. How many sheep in both droves? How many sheep less in the smaller drove?

DRILL EXERCISES.

a. Add 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 separately, to each number given below, by columns and by lines. Notice the unit figure of the sums. Name results only: do not say 5 and 11 are 16, but say 16.

	a	b	c	d	e	f	g	h	i	j
1.	1	2	3	4	5	6	7	8	9	10
2.	11	12	13	14	15	16	17	18	19	20
3.	21	22	23	24	25	26	27	28	29	30
4.	31	32	33	34	35	36	37	38	39	40
5.	41	42	43	44	45	46	47	48	49	50
6.	51	52	53	54	55	56	57	58	59	60
7.	61	62	63	64	65	66	67	68	69	70
8.	71	72	73	74	75	76	77	78	79	80
9.	81	82	83	84	85	86	87	88	89	90
10.	91	92	93	94	95	96	97	98	99	100

b. Subtract 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 separately, from each number given above, by columns and by lines, except in line 1. Name results only.

READ THE SUMS AND DIFFERENCES AT SIGHT.

40	50	30	70	80	90	500	350	875
20	30	10	50	40	60	200	100	500

COPY AND FIND THE SUMS.

1. Mr. Horn bought

1 silk cap	90¢
1 pair of gloves	65¢
2 handkerchiefs	50¢

2. Harry Jones bought

2 Leghorn chickens	60¢
1 setting of eggs	75¢
1 white Leghorn rooster	80¢

3. Mrs. Lamb bought

2 pounds Rio coffee	50¢
1 pound gunpowder tea	60¢
1 box baking powder	48¢
3 pounds of rice	20¢

When dollars and cents are expressed in figures, a period is placed between the dollars and cents. Thus five dollars and twenty-four cents is written \$5.24; two dollars and seven cents is written \$2.07.

1. Read the following:

\$342	\$415	\$750	\$575	\$200	\$50
42	15	40	500	100	25

2. Name the sums and differences of the above Numbers.
3. A man earned \$8 on one job, \$7 on another, and \$5 on a third. How many dollars did he earn?
4. A butcher bought a cow for \$30 and a calf for \$4. What did he pay for both?
5. A farmer sold some butter for \$24, and eggs for \$2. How much money did he receive?
6. In a stable that has 35 stalls, there are cows in all the stalls except 8. How many cows in the stable?
7. I bought a pair of shoes for \$3, and a hat for \$3. How much money did I spend?
8. Mr. Helm bought a book-case for \$58, and I bought one for \$10 less. What did I pay for mine?

REVIEW—ORAL.

1. A fly has six legs. How many legs have 1 fly and 1 dog? 1 fly and 2 dogs?
2. My slate is 12 inches long and my reader is 5 inches less. How long is my reader? How long are both together?
3. 16 is the sum of what two equal numbers?
4. If 9 be taken from a certain number 7 remains. What is that number?
5. How much money is \$5, \$7, \$2 and \$10?
6. 35 is how many less than 44?
7. How many greater is 68 than 51?
8. \$25 + \$25 + \$50 + \$100 = ?
9. The sum of two numbers is 75. One of the numbers is 42. What is the other number?
10. In a car that has 64 seats there are 15 empty seats. How many people in the car?

LESSON XXVI.

REVIEW—WRITTEN.

1. Find the sum of 1 thousand forty, 3 hundred 3, 2 hundred thirty, and 6.
2. 121 cows + 45 cows + 1012 cows = ?
3. 95 men − 43 men + 1200 men = ?
4. Find the difference of \$275 and \$122.
5. \$88 − \$11 − \$22 − \$33 − \$2 − \$5 − \$5 = ?

2	8																					14	20
4	10	★	★	★	★	★	★	★	★	★	★	★	★									16	22
6	12	★	★	★	★	★	★	★	★	★	★	★	★									18	24

1. Two stars and two stars are how many stars?
2. How many 2's in 4? What is $\frac{1}{2}$ of 4?
3. How many times 2 stars equal 6 stars?
4. How many 2's in 6? How many 3's in 6?
5. How many are $\frac{1}{2}$ of 6 stars? $\frac{1}{3}$ of 6 stars?
6. How many 2's can be taken from 6? $6 \div 2 = ?$
7. 2 stars + 2 stars + 2 stars + 2 stars = ?
8. 4 times 2 stars are how many stars?
9. How many 2's can you take from 8? $8 \div 2 = ?$
10. What is $\frac{1}{2}$ of 8? What is $\frac{1}{4}$ of 8?
11. What is $\frac{2}{4}$ of 8? ($\frac{2}{4}$ equal two times $\frac{1}{4}$.)
12. What is $\frac{3}{4}$ of 8?
13. 5 times 2 stars equal how many stars?
14. How many 2's in 10? 2 times 5 equal what?
15. How many times can you take 2 stars from 10 stars?
16. How many 5's in 10? $10 \div 2 = ?$ $10 \div 5 = ?$
17. What is $\frac{1}{5}$ of 10 stars? $\frac{2}{5}$ of 10 stars?
18. 6 times 2 stars are how many stars?
19. How many 2's in 12? $12 \div 2 = ?$ $12 \div 6 = ?$
20. What is $\frac{1}{2}$ of 12? $\frac{1}{3}$ of 12? $\frac{1}{4}$ of 12?
21. 7 times 2 stars are how many stars?
22. How many 2's in 14? $14 \div 2 = ?$ $14 \div 7 = ?$

2×8 is read 2 multiplied by 8, or 8 times 2.
$16 \div 2$ is read 16 divided by 2, or 2 in 16.

1. How many are 8 times 2 stars? $2 \times 8 = ?$
2. How many 2's in 16? How many 8's in 16?
3. What is $\frac{1}{2}$ of 14? $\frac{1}{2}$ of 16? $16 \div 2 = ?$
4. 9 times 2 stars are how many stars? $2 \times 9 = ?$
5. How many 2's in 18? How many 9's in 18?
6. What is $\frac{1}{2}$ of 18 stars? $18 \div 2 = ?$
7. 10 rows of 2 stars each are how many stars?
8. How many 2's in 20? $2 \times 10 = ?$
9. How many 10's in 20? $20 \div 2 = ?$
10. 11 times 2 stars equal how many stars?
11. How many 2's in 22? $2 \times 11 = ?$
12. How many 11's in 22? $22 \div 2 = ?$
13. There are 12 rows of two stars each? How many stars are there?
14. 24 is how many 2's? $2 \times 12 = ?$
15. How many 2's in 24? $24 \div 2 = ?$
16. What is the cost of 12 papers at 2 cents each?
17. 11 is $\frac{1}{2}$ of what number? 12 is $\frac{1}{2}$ of what number?
18. 12 things are a dozen. How many cents will a dozen eggs cost at 2 cents each?
19. 15 equals how many 2's and how many remainder?
20. What part of 18 is 9? of 24 is 12?

1. How many 2 cent stamps can I buy with 6 cents?
2. I lost a fourth of 8 dollars? How many dollars did I lose?
3. I gave $5 to James, which was ½ of my money. How many dollars did I have at first?
4. There are 10 dimes in a dollar. How many dimes in ½ of a dollar?
5. What is the cost of 7 apples worth 2 cents each?
6. What is the cost of 9 pens worth 2 cents each?
7. Mary is 20 years old, and Jane is one half as old. How old is Jane?

ORAL AND WRITTEN.

8.

	a	b	c	d	e	f	g	h	i
Multiply	2	2	2	2	2	2	2	2	2
by	4	2	5	7	3	9	6	8	1

9.

	a	b	c	d	e	f
Divide	2)4	2)8	2)6	2)16	2)20	2)12

NAME RESULTS RAPIDLY.

10. 4 dimes + 2 dimes = ?
11. 15c. + 2c. + 2c. = ?
12. 17 boys − 12 boys = ?
13. $200 + $20 + $2 = ?
14. 6 − 2 = ?
15. 19 − 4 = ?
16. 12 + 7 = ?
17. 20 − 8 = ?

ADDITION.

1.	2.	3.	4.
86 houses	72 cars	24 tugs	$50
51 houses	30 cars	50 tugs	75
72 houses	53 cars	74 tugs	91
90 houses	84 cars	80 tugs	72

SUBTRACTION.

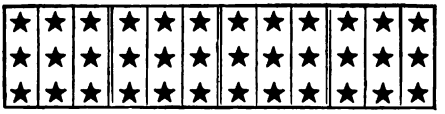
5.	6.	7.	8.
58 knobs	89 corks	68 pans	$74
24 knobs	48 corks	15 pans	32

9.	10.	11.	12.
45 posts	39 rings	93 dots	$65
23 posts	17 rings	51 dots	40

FIND THE PRODUCTS.

13.	14.	15.	16.
42 birds	53 trees	72 bugs	$94
2	2	2	2

84

3	12		21	30
6	15		24	33
9	18		27	36

1. How many are 3 stars and 3 stars?
2. How many 3's in 6? $6 \div 3 = ?$
3. How many 2's in 6? $6 \div 2 = ?$
4. 3 stars + 3 stars + 3 stars equal what?
5. How many 3's in 9? $9 \div 3 = ?$
6. What is $\frac{1}{3}$ of 9? $\frac{2}{3}$ of 9?
7. How many are 4 times 3 stars? 4 times 3 = ?
8. How many 3's in 12? $12 \div 4 = ?$ $12 \div 3 = ?$
9. How many are $\frac{1}{3}$ of 12 and $\frac{1}{4}$ of 12?
10. How many are 5 times 3 stars? 5 times 3 = ?
11. How many 3's in 15? $15 \div 5 = ?$ $15 \div 3 = ?$
12. If there are 3 stars in a line, how many stars in 6 lines?
13. How many 3's in 18? 6 times 3 = ?
14. What is $\frac{1}{3}$ of 18? $18 \div 3 = ?$ $18 \div 6 = ?$
15. 7 times 3 stars are how many? 7 times 3 = ?
16. 21 equals how many 3's? $21 \div 3 = ?$
17. What is $\frac{1}{3}$ of 21? $21 \div 7 = ?$
18. How many are 8 times 3 stars? 8 times 3 = ?
19. How many 3's in 24? $24 \div 3 = ?$
20. What is $\frac{1}{2}$ of 24? $\frac{2}{3}$ of 24?

1. How many stars in 9 rows of 3 stars each?
2. How many 3's in 27? $3 \times 9 = ?$
3. What is $\frac{1}{3}$ of 27? $\frac{2}{3}$ of 27? $27 \div 3 = ?$
4. 10 times 3 stars are how many stars? $3 \times 10 = ?$
5. What is $\frac{1}{3}$ of 30? $\frac{2}{3}$ of 30? $\frac{3}{3}$ of 30?
6. How many are 11 times 3 stars? $3 \times 11 = ?$
7. How many 3's in 33? $33 \div 3 = ?$
8. What is $\frac{1}{3}$ of 33? $\frac{2}{3}$ of 33?
9. 12 times 3 stars are how many stars?
10. 36 is how many 3's? 36 is how many 12's?
11. What is $\frac{1}{3}$ of 36? $36 \div 3 = ?$

Multiply at sight

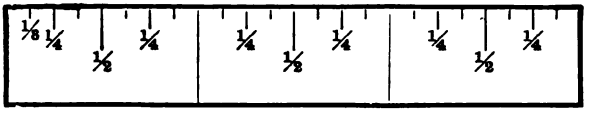
3	3	3	3	3	3	3	3
5	3	7	9	6	2	8	4

Divide at sight

3)21 3)12 3)24 3)30 3)36 3)33

Add upward, to the right, to the left, downward.

	a	b	c	d	e	f	g	h	i
j	3	3	2	2	3	3	2	2	3
k	3	2	3	2	2	3	3	5	2
l	1	2	1	3	3	2	1	3	1
m	2	1	3	2	1	1	4	1	4
n	5	5	2	1	4	3	2	3	2
o	3	3	3	3	3	2	3	2	3



12 inches = 1 foot. 3 feet = 1 yard.
1 foot = 12 inches. 1 yard = 3 feet.

1. How many inches in 2 feet? in 3 feet?
2. 9 feet equal how many yards?
3. What part of a yard is 1 foot?
4. If a yard of cloth cost 30 cents, what will 1 foot cost?
5. Three five-dollar bills equal how many dollars?
6. A pansy-blossom has five petals? How many petals have three pansy-blossoms?
7. Three horses have how many feet?
8. If 1 barrel holds 3 bushels, how many bushels of apples in 7 barrels?
9. At $9 a week, how many weeks will it take to earn $27?
10. James is 12 years old; his age is $\frac{1}{3}$ his father's age. How old is his father?
11. A spider has 8 legs. How many legs have 3 spiders?
12. A building has 3 stories of equal height. If the building is 33 feet high, how high is each story?

REVIEW—ORAL.

1. How many 2's in 18? 22? 16? 24? 14?
2. How many 3's in 12? 21? 18? 24? 27? 33? 15? 9? 36? 30? 10? 25?
3. What is $\frac{1}{2}$ of 20? 16? 12? 18? 24? 22?
4. What is $\frac{1}{3}$ of 12? 24? 27? 33? 36? 21?
5. What part of 12 is 2? of 18 is 6? of 27 is 3? of 33 is 11? of 24 is 3? of 21 is 3?
6. What is $\frac{1}{3}$ of 24? $\frac{2}{3}$? $\frac{3}{3}$? $\frac{1}{2}$? $\frac{2}{2}$?
7. The product of what two numbers is 4? is 9? is 15? is 24? is 27? is 21? is 18?
8. $2 \times 7 = ?$ $3 \times 8 = ?$ $2 \times 12 = ?$ $3 \times 9 = ?$ $3 \times 12 = ?$
9. $15 \div 3 = ?$ $21 \div 3 = ?$ $22 \div 2 = ?$ $18 \div 2 = ?$
10. Find the cost of 1 dozen papers at 3c. each.

LESSON XXXV.

REVIEW—WRITTEN.

1.	*2.*	*3.*	*4.*	*5.*	*6.*
243	313	234	431	232	322
2	3	2	3	2	3

7. What is the cost of 2 cows at $52 each?
8. How many feet in 412 yards?
9. Two rows of 432 trees each equal what?
10. Find the cost of 3 horses at $132 each.

4 16

8 20

12 24

28 40

32 44

36 48

1. Count the stars in one column; in two columns.
2. How many 4's in 8? 2 times 4 equal what number?
3. Two 4's are how many? $8 \div 4 = ?$
4. Three columns contain what number of stars?
5. 3 wagons have how many wheels?
6. Twelve things are 1 dozen. What is $\frac{1}{4}$ of a dozen?
7. 12 divided by 4 equals what number? $12 \div 3 = ?$
8. 4 stars + 4 stars + 4 stars + 4 stars = ?
9. How many times 4 marks are 16 marks?
10. Mr. Dow planted 16 hills of beans in 4 rows. How many hills did he plant in a row?
11. Make dots on the slate to show how Mr. Dow planted the beans.
12. There are 16 ounces in one pound. How many ounces in $\frac{1}{4}$ of a pound? in $\frac{2}{4}$ of a pound? in $\frac{3}{4}$ of a pound?
13. How many stars in 5 columns? $4 \times 5 = ?$
14. A wild rose has 5 petals. How many petals have 4 wild roses?

ORAL.

1. Edna planted 20 peach seeds in 5 hills. How many peach seeds did she put in one hill?
2. How many stars in 6 rows? $4 \times 6 = ?$
3. If it takes 4 yards to make a boy's coat, how many yards are needed to make 6 boys' coats?
4. Mary had 24 cents; she bought one yard of lawn for 6 cents. What part of her money did she spend?
5. 7 columns of stars are how many stars?
6. How many 4's in 28? How many 7's in 28?
7. How many feet do 5 cats have?
8. If I earn \$28 in 4 days, how many dollars do I earn in one day?
9. What is $\frac{1}{4}$ of 28 feet? $28 \div 4 = ?$
10. What number of stars in 8 columns? $4 \times 8 = ?$
11. I had 32 cents and spent $\frac{1}{4}$ of that sum for pears? What did the pears cost?
12. A man paid \$32 for 4 sheep. How many dollars apiece did he pay?
13. How many 4's in 32? How many 8's in 32?
14. How many stars in 5 columns? $4 \times 5 = ?$
15. 9 chairs have how many legs?
16. 36 are how many 4's?
17. What is $\frac{1}{4}$ of 36? $36 \div 4 = ?$

1. How many stars in 10 columns? (See page 38.)
2. How many 4's in 40? How many are $\frac{1}{4}$ of 40?
3. 11 columns of stars are how many stars?
4. What will 4 pounds of ham cost at 11 cents a pound?
5. How many 4's in 44? $44 \div 4 = ?$
6. Paid 44 cents for 4 yards of muslin. What was the cost of one yard?
7. How many stars in 12 columns?
8. 12 cows have how many feet?
9. If I earn \$4 in one week, in how many weeks can I earn \$48?
10. How many 4's in 48? $48 \div 4 = ?$
11. There are 12 children in a group going to school; each child has 4 books. How many books have they?
12. 48 men are marching down the street in 4 ranks. How many men in each rank?

READ THE RESULTS AT SIGHT.

Products:

5	2	11	7	4	6	9	10	8	12	3
4	4	4	4	4	4	4	4	4	4	4

Quotients:

16	32	44	24	12	48	20	36	8	4
4	4	4	4	4	4	4	4	4	4

1. I sold 4 cows at $42 apiece. How much money did I get for them?
2. What is the cost of 4 pounds of butter at 22 cents a pound?
3. Mr. Tream sold 4 horses at $122 a head. How many dollars did he get for the horses?
4. What will 32 quarts of milk cost at 4 cents a quart? Find the cost at 3 cents a quart.
5. What will 121 oranges cost at 4 cents each?
6. Find the cost of 202 barrels of apples at $2 a barrel. Find the cost of the apples at $3 a barrel.

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7. A gardener set out 4 rows of trees, putting 82 trees in a row. How many trees did he set out?
8. How many bushels of wheat in 324 bags, if each bag contains 2 bushels?
9. At $4 a yard what will 220 yards of cloth cost?
10. If a person pays $4 a week for board, how much does he pay for 1 year, that is, 52 weeks?
11. A mason receives $4 a day. How much will he receive for 221 days' work?
12. A party of 73 persons hired a boat, each paying $3 for the round trip. What was paid in all for the boat?

5	20	★	★	★	★	★	★	★	★	★	★	★	35	50
		★	★	★	★	★	★	★	★	★	★	★		
10	25	★	★	★	★	★	★	★	★	★	★	★	40	55
		★	★	★	★	★	★	★	★	★	★	★		
15	30	★	★	★	★	★	★	★	★	★	★	★	45	60

1. Count the stars in one column.
2. How many stars in two columns? $5 \times 2 = ?$
3. How many 5's in 10? $10 \div 5 = ?$
4. In 3 columns are how many stars? 3 times $5 = ?$
5. What is $\frac{1}{5}$ of \$15? $\frac{2}{5}$ of 15 horses?
6. 5 stars + 5 stars + 5 stars + 5 stars = ?
7. How many 5's in 20? How many 4's in 20?
8. Mr. Dale had a score of pencils and lost $\frac{1}{5}$ of them. How many had he left?
9. How many stars in 5 columns? $5 \times 5 = ?$
10. How many pears at 5 cents apiece can I buy for 25 cents?
11. Place 25 dots neatly in five rows of 5 dots each. How many dots on each side of the group?
12. How many are 6 times 5 stars?
13. How many 5's in 30? 6 times $5 = ?$
14. What is $\frac{1}{5}$ of 30? $\frac{2}{5}$ of 30? $\frac{3}{5}$ of 30?
15. 7 columns of stars equal how many stars?
16. Harold spent $\frac{1}{5}$ of 35 cents for a pencil. What did the pencil cost?

ORAL.

1. How many stars in 8 columns? $5 \times 8 = ?$
2. What is $\frac{1}{5}$ of 40? $\frac{3}{5}$ of $40 = ?$
3. How many 5's in 40? How many 8's in 40?
4. 9 times 5 stars equal how many stars?
5. How many 5's in 45? $5 \times 9 = ?$
6. How many oranges at 5c. each can be bought for 45c.?
7. What is $\frac{1}{5}$ of 45? $45 \div 5 = ?$
8. 10 rows of 5 stars each equal how many stars?
9. What is $\frac{1}{5}$ of 50? $50 \div 5 = ?$
10. How many stars in 11 columns? $5 \times 11 = ?$
11. How many 5's in 55? $55 \div 5 = ?$
12. What is $\frac{1}{5}$ of 55? $\frac{2}{5}$ of 55? $\frac{3}{5}$ of 55?
13. 12 columns of 5 stars each are how many stars?
14. How many 5's in 60? $5 \times 12 = ?$
15. What is $\frac{1}{5}$ of 60? $\frac{2}{5}$ of 60? $60 \div 5 = ?$
16. How many 12's in 60? in 48?

Products at sight:

3	4	5	7	6	8	9	12	11	2	10
5	5	5	5	5	5	5	5	5	5	5

Quotients at sight:

20	30	10	50	35	25	40	15	45	60	55
5	5	5	5	5	5	5	5	5	5	5

1. 5 is what part of 25? What is $\frac{2}{5}$ of 25?
2. If 25 peaches be divided equally among 5 boys, how many peaches will each boy receive?
3. Jane has 6 "nickels." How many cents has she?
4. An orchard has 30 trees in 5 rows. How many trees in a row?
5. A bug has 6 legs. How many legs have 5 bugs?
6. 5 weeks are how many days?
7. If one pie be cut into 5 pieces, how many pies will be needed for 35 pieces?
8. Mr. Dunn is 40 years old. His son is $\frac{1}{5}$ as old. How old is his son?
9. There are 9 square feet in one square yard. How many square feet in 5 square yards?
10. With a yard stick draw four lines so as to form a one yard on each side; divide this square into nine equal squares by drawing four lines through it?
11. What is the cost of 9 yards of silk at $5 a yard?
12. One dime is what part of 50 cents?
13. If Easter cards cost 5 cents each, how many can be bought for 50 cents?
14. What is the cost of 11 rides at 5 cents a ride?

COPY NEATLY AND FIND THE SUMS.

1.	2.	3.
76 men	27 eggs	48 tubs
82 men	92 eggs	71 tubs
men	eggs	tubs

FIND THE PRODUCTS.

4.	5.	6.
432 guns	322 days	511 yards
2	4	5
guns	days	yards

FIND THE DIFFERENCES.

7.	8.	9.
406 gallons	631 acres	356 cars
203 gallons	410 acres	234 cars

10.	11.	12.
3 ⟌ 36 bushels	5 ⟌ 50 dollars	3 ⟌ 27 cents
bushels	dollars	cents

1. What is the cost of 8 coats worth $5 each?
2. How many books worth $3 each can I buy for $24.
3. I lost $4, which was one fourth of my money. How many dollars had I at first?
4. A hen had 12 chickens and lost $\frac{1}{4}$ of them. How many chickens did she lose?
5. Ada is 6 years old, and is $\frac{1}{5}$ as old as her mother. How old is her mother?
6. There are 25 cents in a quarter of a dollar. How many cents in three quarters of a dollar?
7. There are 24 hours in a day and night. If a boy sleeps one third of his time, how many hours does he sleep?
8. If a boy studies one fourth of his time, how many hours does he study?
9. What is the cost of 4 boxes worth 7 cents each?
10. If a wagon can carry 6 men, how many men can 5 such wagons carry?
11. How many pairs of skates may there be in 24 skates?
12. Each of 4 boys has 9 cents. How many cents have they all?
13. There are 12 spokes in each of 4 wheels. How many spokes in all of the wheels?
14. How many yards in 36 feet?

1.	*2.*	*3.*	*4.*	*5.*	*6.*
26	38	71	53	45	17
44	57	28	87	18	28
47	62	65	94	76	90

17 = sum of units.
10 = sum of tens.
117 = sum of units and tens.

7.	*8.*	*9.*	*10.*	*11.*	*12.*
42	83	49	93	73	58
58	17	80	56	81	71
36	25	27	84	29	97

LESSON XLVI.

REMARK.—Instead of writing the results, as in the above, add the tens to the column of tens as you proceed, and write the result, as shown in example 1.

1.	*2.*	*3.*	*4.*	*5.*	*6.*
187	296	143	256	281	233
228	183	351	242	354	199
177	247	239	187	398	325
592					

7.	*8.*	*9.*	*10.*	*11.*	*12.*
258	175	281	267	374	560
372	438	195	528	438	198
183	367	479	184	199	247

LESSON XLVII.

REVIEW—ORAL.

1. How many are 4×5? 4×7? 4×6? 5×3? 5×5? 4×8? 4×11? 5×6? 5×9?
2. $5 \times 7 = ?$ $4 \times 9 = ?$ $5 \times 12 = ?$ $4 \times 12 = ?$
3. How many 5's in 30? 40? 45? 25? 55?
4. How many 4's in 16? 24? 32? 28? 36?
5. What is $\frac{1}{5}$ of 30? 40? 45? 60?
6. What is $\frac{1}{4}$ of 24? $\frac{2}{4}$? $\frac{3}{4}$? $\frac{4}{4}$?
7. What is $35 \div 5$? $40 \div 8$? $28 \div 4$? $48 \div 4$? $55 \div 11$? $24 \div 3$?
8. At \$6 a cord, what will 5 cords of wood cost?
9. What is the cost of 1 dozen eggs if 5 dozen cost 60c.

LESSON XLVIII.

REVIEW—WRITTEN.

1. At \$532 a lot, what is the cost of 3 lots?
2. A certain lot has 4 equal sides, each being 212 yards long. How far around the lot?
3. A drover bought 420 head of cattle for \$3,807, 149 head for \$1,090, and 330 head for \$2,102. How many cattle did he buy? What did he pay for them?
4. $\$874 + \$585 - \$135 + \$890 = ?$
5. What is the cost of 5 houses at \$3,100 each?

1. From 35 take 17.

		Proof:
35 = Minuend	= 20 + 15	17 = Subtrahend.
17 = Subtrahend	= 10 + 7	18 = Remainder.
18 = Remainder	= 10 + 8	35 = Minuend.

REMARK.—As 7 units cannot be taken from 5 units, 1 of the 3 tens is placed with the 5 units, making 15 units. 7 units from 15 units leaves 8 units. 1 ten from the 2 remaining tens leaves 1 ten.

PROOF OF SUBTRACTION: *Subtrahend + Remainder = Minuend.*

2. From 45 take 28.
3. From 82 take 54.
4. From 75 take 46.
5. $94 less $35.
6. $66 less $39.
7. $85 less $36.

LESSON L.

FIND THE DIFFERENCES.

1.	*2.*	*3.*	*4.*	*5.*	*6.*
356	473	585	672	784	897
128	256	249	345	547	649
228					

7.	*8.*	*9.*	*10.*
428 = 300 + 120 + 8	435	549	657
254 = 200 + 50 + 4	182	365	473
174 = 100 + 70 + 4			

11. From $812 take $641.
12. $525 less $244.
13. From $648 take $355.
14. $438 less $152.

COPY AND COMPLETE THE FOLLOWING.

1.	$15 \div 3 = ?$	$15 \div 2 =$ ..... and ..... remainder.
2.	$18 \div 3 = ?$	$17 \div 3 =$ ..... and ..... remainder.
3.	$15 \div 5 = ?$	$20 \div 3 =$ ..... and ..... remainder.
4.	$28 \div 4 = ?$	$23 \div 4 =$ ..... and ..... remainder.
5.	$35 \div 5 = ?$	$25 \div 4 =$ ..... and ..... remainder.
6.	$40 \div 4 = ?$	$28 \div 5 =$ ..... and ..... remainder
7.	$50 \div 5 = ?$	$30 \div 4 =$ ..... and ..... remainder.
8.	$36 \div 4 = ?$	$32 \div 5 =$ ..... and ..... remainder.
9.	$21 \div 3 = ?$	$34 \div 5 =$ ..... and ..... remainder.
10.	$60 \div 5 = ?$	$21 \div 2 =$ ..... and ..... remainder.
11.	$45 \div 5 = ?$	$25 \div 2 =$ ..... and ..... remainder.
12.	$55 \div 5 = ?$	$28 \div 3 =$ ..... and ..... remainder.
13.	$30 \div 5 = ?$	$35 \div 4 =$ ..... and ..... remainder.
14.	$48 \div 4 = ?$	$38 \div 4 =$ ..... and ..... remainder.
15.	$50 \div 10 = ?$	$39 \div 5 =$ ..... and ..... remainder.
16.	$44 \div 4 = ?$	$41 \div 5 =$ ..... and ..... remainder.
17.	$32 \div 8 = ?$	$43 \div 4 =$ ..... and ..... remainder.
18.	$24 \div 6 = ?$	$47 \div 5 =$ ..... and ..... remainder.
19.	$21 \div 7 = ?$	$48 \div 5 =$ ..... and ..... remainder.
20.	$40 \div 8 = ?$	$51 \div 5 =$ ..... and ..... remainder.
21.	$60 \div 12 = ?$	$53 \div 5 =$ ..... and ..... remainder.
22.	$48 \div 12 = ?$	$57 \div 5 =$ ..... and ..... remainder.
23.	$36 \div 12 = ?$	$63 \div 5 =$ ..... and ..... remainder.
24.	$12 \div 3 = ?$	$54 \div 5 =$ ..... and ..... remainder.
25.	$27 \div 3 = ?$	$49 \div 4 =$ ..... and ..... remainder.

1. A man borrowed $175; he paid $58. How much does he still owe?
2. A barrel of sugar that contained 326 pounds now contains only 132 pounds. How many pounds of sugar have been sold out of the barrel?
3. What is the weight of 4 barrels of oil, if there are 375 pounds in a barrel?
4. If 156 be taken from 585, what is the remainder?
5. A gentleman sold a lot for $785, a load of hogs for $113, and a car load of cattle for $389. How many dollars did he receive for all?

LESSON LIII.

1. If a boy earns $124, and spends $24 for clothing, how much money will he have left?
2. Henry shot an arrow 97 feet from where he was standing. How many feet will he have to go to pick up his arrow and return?
3. A farmer sold a horse for $175, which was $38 more than the cost. What was the cost?
4. The silk and trimmings of a dress cost $46, and the making of the dress $18. Find the cost of the dress.

1. If I save 12 cents a day, how many cents can I save in 5 days?
2. If I pay 12 cents for a slate, how many cents do I pay for 4 such slates?
3. I had 32 yards of string, and lost a fourth of it. How many yards did I lose?
4. I sold a twelfth of my apples for 5 cents. How many cents should I receive for all of them?
5. If I spend 12 cents a day, in how many days shall I spend 60 cents?
6. If I have 36 pears, to how many children can I give 4 pears each?
7. How much do I weigh if 12 pounds be a fourth of my weight?
8. Mr. Snow has 12 sheep, which are one fifth of the number of sheep that he sold. How many sheep did he sell?
9. How many inches in 4 feet? In $\frac{1}{2}$ of 4 feet?
10. If I divide 36 loaves of bread equally among 12 persons, how many loaves do I give to each?
11. I bought 12 spools of thread for 60 cents. How much did I give a spool?
12. If I learn 12 lessons in one week, in how many weeks can I learn 24 lessons?
13. If I can write 12 lines in one lesson, how many lines can I write in 4 lessons?

1.	2.	3.	4.	5.
$32	$54	$15	$48	$71
50	38	23	65	24
70	11	32	51	48
47	63	44	83	18
$199				

6. $876 − $523

7. $759 − $341

8. $456 − $123

9. $476 − $124

10. $684 − $361

11. $864 − $541

LESSON LVI.

1. Add the four numbers in examples 6 and 9.
2. Add the four numbers in examples 7 and 10.
3. Add the four numbers of examples 8 and 11.
4. A farmer paid $75 for a wagon, and $120 for a horse. How much did he pay for both?
5. Mr. Ray bought a stove for $40, a carpet for $100, and a chair for $10. How much did he pay for all?
6. I paid Mr. Carr, $24; Mr. Deal, $13; and Mrs. Clark, $52. How much did I pay to all of them?
7. I paid $15 for a table, and $3 for a lamp. How much more did I pay for the table than for the lamp?

LESSON LVII.

COPY NEATLY AND FIND THE PRODUCTS.

1.	2.	3.	4.	5.
36	58	54	92	87
2	3	4	5	2
6.	7.	8.	9.	10.
46	68	73	85	96
3	4	5	2	3
11.	12.	13.	14.	15.
123	456	789	912	385
4	5	5	4	5
16.	17.	18.	19.	20.
364	476	389	573	528
3	5	4	2	3
21.	22.	23.	24.	25.
2130	3205	2102	1453	3365
3	3	3	3	3

SUBTRACT.

1.	2.	3.	4.	5.	6.
460	680	710	840	950	970
245	436	347	568	675	389
215					

7.	8.	9.	10.	11.	12.
508	609	304	805	706	907
250	428	172	562	375	544
258					

LESSON LIX.

SUBTRACT.

1.	2.	3.	4.
305 = 200 + 90 + 15	602	403	808
147 = 100 + 40 + 7	358	185	529
158 = 100 + 50 + 8			

5.	6.	7.	8.	9.
108 = 90 + 18	102	307	101	109
59 = 50 + 9	28	58	75	39
49 = 40 + 9				

10.	11.	12.	13.	14.	15.
407	202	907	704	809	606
208	105	409	306	509	407
199					

1.	$\frac{1}{2}$ of 18 = ?	11 is $\frac{1}{2}$ of what number?
2.	$\frac{1}{3}$ of 24 = ?	9 is $\frac{1}{3}$ of what number?
3.	$\frac{1}{4}$ of 44 = ?	8 is $\frac{1}{4}$ of what number?
4.	$\frac{1}{5}$ of 45 = ?	7 is $\frac{1}{5}$ of what number?
5.	$\frac{1}{4}$ of 36 = ?	12 is $\frac{1}{3}$ of what number?
6.	$\frac{1}{2}$ of 24 = ?	6 is $\frac{1}{5}$ of what number?
7.	$\frac{1}{5}$ of 60 = ?	10 is $\frac{1}{4}$ of what number?
8.	$\frac{1}{3}$ of 33 = ?	5 is $\frac{1}{4}$ of what number?
9.	$\frac{1}{5}$ of 35 = ?	11 is $\frac{1}{3}$ of what number?
10.	$\frac{1}{4}$ of 48 = ?	8 is $\frac{1}{5}$ of what number?
11.	$\frac{1}{2}$ of 16 = ?	7 is $\frac{1}{4}$ of what number?
12.	$\frac{1}{5}$ of 55 = ?	12 is $\frac{1}{5}$ of what number?

13. 4 is the product of what two equal numbers?
14. 9 is the product of what two equal numbers?
15. 16 is the product of what two equal numbers?
16. 25 is the product of what two equal numbers?
17. 18 is the sum of what two equal numbers?
18. How many 4's in 20? in 36? in 48? in 28?
19. How many 3's in 18? in 21? in 33? in 27?
20. How many 5's in 15? in 35? in 45? in 60?
21. How many 5's in 50? in 30? in 40? in 55?
22. How many 4's in 16? in 32? in 44? in 24?
23. $3 \times 8 = ?$ $4 \times 7 = ?$ $5 \times 7 = ?$ $3 \times 9 = ?$
$4 \times 6 = ?$ $5 \times 11 = ?$ $4 \times 12 = ?$
24. $18 \div 6 = ?$ $36 \div 4 = ?$ $45 \div 5 = ?$ $27 \div 3 = ?$
$60 \div 5 = ?$ $35 \div 7 = ?$ $30 \div 5 = ?$

1. Mr. Stone earned $75 in the winter, $84 in the spring, $94 in the summer, and $89 in the fall. How many dollars did he earn in the whole year?
2. A man bought a lot for $356; he put a fence around it at a cost of $108. What did the whole cost him?
3. A common year has 365 days. July 4th is the 185th day of the year. How many days in the year after the 4th of July?
4. 196 pounds of flour in a barrel. How many pounds of flour remain after a sack of 49 pounds has been sold out of a barrel?

LESSON LXII.

1. Mr. Hale has $15; he buys a pair of shoes for $3. How many dollars will he have left?
2. A family uses 31 quarts of milk a month. How much will their milk bill amount to in a month, at 5c. a quart?
3. A monthly railroad ticket costs $6. What is the cost of three such monthly tickets?
4. A sleigh is worth $85; a horse, $175; and a harness, $48. What is the value of the three?

12 things = 1 dozen (doz.)	1 dozen = 12 units.
12 dozen = 1 gross (gro.)	1 gross = 12 dozen.
20 things = 1 score (sc.)	1 score = 20 units.

1. If eggs are worth 2c. each, what is the cost of one dozen?
2. How many dozen in $\frac{1}{2}$ of a gross?
3. Two gross equal how many dozen?
4. 4 dozen oranges are how many oranges?
5. What is the difference between a dozen and a score?
6. If a man is two score years old, how old is he?
7. John's hens lay three eggs a day. In how many days will they lay one dozen eggs? Two dozen?
8. What is the cost of one gross of buttons at 5c. a dozen?
9. A lady sold 4 dozen eggs at 12 cents a dozen. How much money did she get for them?
10. What is the cost of 9 dozen clothes-pins at 4c. a dozen?
11. Find the value of 8 dozen plums at 5c. a dozen.
12. At 5c. a dozen, how many dozen hair pins can I buy for 20c.
13. How many dozen screws, at 3c. a dozen, can be bought for 27c.?

1. Find the product of 34 multiplied by 3.

34 is the Multiplicand.
3 is the Multiplier.
102 is the Product.

2. Find the product of 25 multiplied by 4.
3. Find the product of 42 multiplied by 5.
4. 64 is the multiplicand; 4 is the multiplier; what number is the product?
5. 123 is the multiplicand; 3 is the multiplier; what number is the product?

FIND THE PRODUCTS.

6.	*7*	*8.*	*9.*
$209	$314	$425	$157
4	3	2	5

10.	*11.*	*12.*	*13.*
$362	$142	$275	$215
3	5	3	4

FIND THE DIFFERENCES.

14.	*15.*	*16.*	*17.*
$842	$979	$866	$579
321	546	541	436

LESSON LXV.

Read rapidly the results only, downward and upward:

$\frac{1}{2}$ of	$\frac{1}{3}$ of	$\frac{1}{4}$ of	$\frac{1}{5}$ of	$\frac{2}{3}$ of	$\frac{2}{5}$ of
8	6	8	15	3	5
12	12	20	25	9	15
16	15	16	35	12	20
24	21	24	45	18	25
18	18	36	55	21	45
22	24	28	60	15	40
14	30	32	50	24	35
3	27	40	40	33	60
9	36	48	30	27	55
7	33	44	20	36	50
11	5	6	6		
15	7	9	8	$\frac{3}{4}$ of	$\frac{3}{5}$ of
13	8	10	14	4	5
17	10	11	18	8	15
23	13	14	23	12	30
25	16	15	33	16	25
21	23	23	39	28	40
19	25	25	42	24	35
40	29	29	54	36	50
50	31	33	57	48	45
80	34	38	48	44	60
100	35	34	37	32	55
200	300	38	63	400	500

1. Find one half of 26. Divisor, 2)26 Dividend.
13 Quotient.
2. What is $\frac{1}{2}$ of 28? Of 46? Of 68? Of 66? Of 84? Of 64? Of 88? Of 80?
3. What is $\frac{1}{3}$ of 36? Of 63? Of 69? Of 93? Of 99? Of 39? Of 66? Of 96?
4. What is $\frac{1}{4}$ of 24? Of 44? Of 48? Of 84? Of 88?

LESSON LXVII.

1. Divide 428 by 2.

2)428
214

Proof: Multiply the quotient 214 by the divisor 2. If correct, the product equals the dividend. $214 \times 2 = 428$.

2. Divide 246 by 2.
3. Divide 336 by 3.
4. Divide 966 by 3.
5. Divide 488 by 4.
6. Divide 555 by 5.
7. Divide 642 by 2.

LESSON LXVIII.

1. A farmer had 360 acres; he sold $\frac{1}{3}$ of it. How much did he sell? How much had he left?
2. I received \$246, and bought a buggy with half of the money. What did the buggy cost?
3. At \$5 each, how many sheep will \$505 buy?
4. What is $\frac{1}{4}$ of \$884? $\frac{1}{5}$ of \$500?

1. At 3 miles an hour, in what time can a man walk from Chicago to Evanston, a distance of 12 miles?
2. At $3 a yard, how many yards of cloth can I buy for $9.
3. A man earned $16 in 4 days. How much did he earn in one day?
4. At $5 a cord, how many cords of wood can be bought for $35?
5. At 5 cents a quart, how many quarts of milk can be bought for a half a dollar?
6. How many two-cent stamps can I buy for 25 cents?
7. How many pickets in one gate, if 5 gates of equal size require 30 pickets?
8. A farmer having 36 bushels of potatoes, planted $\frac{1}{4}$ of them. How many bushels did he plant?
9. If 44 cents be paid for 4 pounds of ham, what is the cost of a pound?
10. If one fur cap is worth $5, how many fur caps are worth $45?
11. How many 5-gallon cans may be filled from a barrel that contains 50 gallons?
12. If a family uses 5 pounds of butter a week, what time will 45 pounds last them?
13. Which is cheaper, 5 bars of soap for 25 cents, or 1 bar for 6 cents? How much?

LESSON LXX.

1. $2\overline{)36} = \underline{20 + 16}$
$18 = 10 + 8$

2. $2\overline{)58}$ *3.* $2\overline{)54}$ *4.* $2\overline{)92}$ *5.* $2\overline{)76}$

6. $3\overline{)48}$ *7.* $3\overline{)87}$ *8.* $3\overline{)51}$ *9.* $3\overline{)75}$ *10.* $3\overline{)84}$ *11.* $3\overline{)87}$

12. $4\overline{)56}$ *13.* $4\overline{)60}$ *14.* $4\overline{)76}$ *15.* $4\overline{)92}$ *16.* $4\overline{)96}$ *17.* $4\overline{)72}$

LESSON LXXI.

1. $5\overline{)45}$ *2.* $5\overline{)65}$ *3.* $5\overline{)75}$ *4.* $5\overline{)85}$ *5.* $5\overline{)95}$

6. $2\overline{)456}$
228
7. $2\overline{)736}$ *8.* $2\overline{)548}$ *9.* $2\overline{)538}$ *10.* $2\overline{)374}$

11. $3\overline{)735}$ *12.* $3\overline{)816}$ *13.* $3\overline{)522}$ *14.* $3\overline{)414}$ *15.* $3\overline{)736}$

LESSON LXXII.

1. $4\overline{)516}$ *2.* $4\overline{)628}$ *3.* $4\overline{)732}$ *4.* $4\overline{)752}$ *5.* $4\overline{)976}$

6. $5\overline{)615}$ *7.* $5\overline{)850}$ *8.* $5\overline{)785}$ *9.* $5\overline{)975}$ *10.* $5\overline{)645}$

LESSON LXXIII.

READ THE SUMS.

1.	*2.*	*3.*	*4.*	*5.*	*6.*	*7.*
10	20	30	40	50	11	22
20	20	30	40	50	11	22
20	10	20	30	40	11	22
10	50	10	20	30	11	22

8.	*9.*	*10.*	*11.*	*12.*	*13.*	*14.*
44	55	66	333	550	420	305
44	50	60	333	234	420	305

READ THE DIFFERENCES.

15.	*16.*	*17.*	*18.*	*19.*	*20.*	*21.*
555	666	888	999	777	450	500
222	444	333	666	555	6	7

22.	*23.*	*24.*	*25.*	*26.*	*27.*	*28.*
432	754	645	876	978	880	910
200	300	445	370	608	8	9

29. $17 + $6 + $10 = ?
30. 12 pt. + 5 pt. + 9 pt. = ?
31. 8 qt. + 1 qt. + 6 qt. = ?
32. 50 ft. + 10 ft. + 9 ft. = ?
33. 100c. + 40c. + 10c. = ?
34. $\frac{1}{2}$ of $40 = ?
35. $\frac{1}{2}$ of 44c. = ?
36. $\frac{1}{3}$ of 60 men = ?
37. $\frac{1}{4}$ of 80 feet = ?
38. $\frac{1}{5}$ of 100 gals. = ?

LESSON LXXIV.

ADDITION.

1.	*2.*	*3.*	*4.*	*5.*
876	543	374	894	999
473	708	528	673	475
348	926	396	469	123
536	295	687	893	456
473	483	942	742	789

6.	*7.*	*8.*	*9.*	*10.*
890	786	837	345	987
543	938	912	678	987
219	495	346	964	476
787	854	789	321	674
679	693	694	768	345

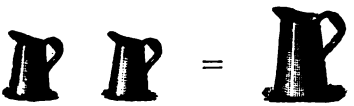
LESSON LXXV

SUBTRACTION.

1.	*2.*	*3.*	*4.*	*5.*
765	934	847	728	681
328	762	258	699	143

6.	*7.*	*8.*	*9.*	*10.*
542	473	875	1383	2590
285	194	549	290	846

11. $5432 − $247 − $376 − $834 − $564 = ?



1 pt. + 1 pt. = 1 qt.

1. How many pints in 2 quarts? In 12 quarts?
2. How many quarts in 24 pints?
3. At 5 cents a pint, what will 2 quarts of coffee cost?
4. How much ice cream at 10 cents a pint can be bought for a half dollar?
5. $\frac{1}{4}$ of a pint is sometimes called a gill. What will 1 gill of alcohol cost if a pint of it is worth 28 cents?
6. If 2 tea-cupfuls equal 1 pint, how many gills in 1 tea-cup?
7. If I use 1 pint of cream a day, what will I pay for cream in one week at 5 cents a pint?

COPY NEATLY AND FIND THE PRODUCTS.

5 pints of molasses, at 10¢ a pint.....

3 quarts of ice cream, at 8¢ a quart.....

4 quarts of oil, at 7¢ a quart.....

2 pints of wine, at 50¢ a pint.....

REVIEW—ORAL.

1. If school is in session 5 hours a day, how many hours of school are there in 2 weeks?
2. What is the price of a dozen buttons at 4 cents apiece?
3. How many 5's in 28? In 32? In 43?
4. 6 dozen is what part of a gross?
5. James is 1 score years old, and his mother is twice as old. How old is she?
6. My coat costs $24, which is twice as much money as I have. How much have I?
7. My horse is worth $100, and my cow $45. What are both worth?
8. A box is 9 inches long and 7 inches wide. How long must a string be to reach around it?

LESSON LXXVIII.

REVIEW—WRITTEN.

1. $135 ÷ 3 = ? $529 − $78 = ?
2. Find one side of a square lot if the distance around it is 980 feet?
3. I paid $925 for wood, at $5 a cord. How many cords did I buy?
4. Sold 135 yards of carpet for $718, 156 yards for $142, 178 yards for $198. How many yards did I sell? What did I get for the whole?

1 qt. + 1 qt. + 1 qt. + 1 qt. = 1 gal.

1. How many quarts in 1 gallon? In 12 gallons?
2. How many gallons in 4 quarts? In 12 quarts?
3. How many gallons in a 10-quart pail?
4. 18 pints equal how many quarts?
5. What is the cost of 1 quart of milk at 20c. a gallon?
6. How many pints in a gallon? In 2 gallons?
7. 1 pint is what part of a gallon?
8. How many quarts fill a 2-gallon jug?
9. There are 4 gills in 1 pint. How many gills in 2 pints? In 4 pints? In 7 pints?
10. How many quart tickets at 5c. each can be bought for a half dollar?
11. How many quart bottles can be filled from 20 pints? From 25 pints?
12. What is the cost of 1 gallon kerosene at 5c. a quart?
13. When vinegar is worth 20c. a gallon, how much can be bought for 5c.?
14. If cream is worth 10c. a pint, how many quarts can I buy for 40c.?

1. How many 2's in 482?
2. How many 2's in 264? 486? 434? 656?
3. How many 3's in 342? 609? 465? 741?
4. How many 4's in 456? 632? 700? 908?
5. How many 5's in 565? 675? 780? 800?

LESSON LXXXI.

1. What is $\frac{1}{2}$ of 1246? 2374? 3456? 4588?

REMARK.—To find $\frac{1}{2}$ of a number, divide the number by 2.

2. What is $\frac{1}{3}$ of 1326? 2367? 4548? 5610?
3. What is $\frac{1}{4}$ of 1704? 2572? 3876? 4056?
4. What is $\frac{1}{5}$ of 1800? 1885? 2505? 5675?

LESSON LXXXII.

1. How many times \$2 are \$234? \$536? \$1154?
2. How many times 3 ft. are 354 ft.? 4572 ft.?
3. How many times 4 pints are 728 pt.? 8964 pt.?
4. How many times 5 cents are 575c.? 6505c.?

LESSON LXXXIII.

1. How many pints in 543 qts.? 4256 qts.?
2. How many feet in 375 yds.? 1456 yds.?
3. How many quarts in 460 gal.? 1584 gal.?
4. How many nickels in 935c. 1468c. 1579c.?

COMPLETE AT SIGHT. REVIEW.

1. ( ) × ( ) = 1.
2. ( ) × ( ) = 2.
3. ( ) × ( ) = 3.
4. ( ) × ( ) = 4.
5. ( ) × ( ) = 5.
6. ( ) × ( ) = 6.
7. ( ) × ( ) = 7.
8. ( ) × ( ) = 8.
9. ( ) × ( ) = 9.
10. ( ) × ( ) = 10.
11. ( ) × ( ) = 12.
12. ( ) × ( ) = 13.
13. ( ) × ( ) = 14.
14. ( ) × ( ) = 15.
15. ( ) × ( ) = 16.
16. ( ) × ( ) = 18.
17. ( ) × ( ) = 20.
18. ( ) × ( ) = 21.
19. ( ) × ( ) = 22.
20. ( ) × ( ) = 24.
21. ( ) × ( ) = 25.
22. ( ) × ( ) = 27.
23. ( ) × ( ) = 28.
24. ( ) × ( ) = 30.
25. ( ) × ( ) = 32.
26. ( ) × ( ) = 33.
27. ( ) × ( ) = 35.
28. ( ) × ( ) = 36.
29. ( ) × ( ) = 40.
30. ( ) × ( ) = 44.
31. ( ) × ( ) = 45.
32. ( ) × ( ) = 48.
33. ( ) × ( ) = 50.
34. ( ) × ( ) = 55.

35. ( ) × ( ) = 60.

36. 2 is what part of 4? Of 8? Of 12? Of 10?
37. 3 is what part of 9? Of 12? Of 6? Of 15?
38. 4 is what part of 8? Of 16? Of 12? Of 20?
39. 5 is what part of 15? Of 10? Of 25? Of 20?
40. 6 is what part of 12? Of 18? Of 30? Of 24?
41. 7 is what part of 14? Of 28? Of 21? Of 35?
42. 8 is what part of 16? Of 32? Of 40? Of 24?

1.	2.	3.	4.	5.
526	954	845	327	534
637	348	789	486	754
246	734	176	547	636
857	653	265	869	557
639	768	376	879	657
582	919	859	588	599

6.	7.	8.	9.	10.
359	257	589	821	523
820	306	269	765	854
271	785	457	638	843
865	843	654	757	541
423	672	577	498	999
543	876	123	439	788
908	199	858	209	852

60 seconds = 1 minute.	7 days = 1 week.
60 minutes = 1 hour.	52 weeks = 1 year.
24 hours = 1 day.	12 months = 1 year.

1. How many days in 3 weeks? In 4 weeks?
2. June has 30 days. How many days more than 4 weeks in the month of June?
3. Two years equal how many months?
4. How many months in $\frac{1}{2}$ year? In $1\frac{1}{2}$ years?
5. $\frac{1}{6}$ of an hour equals how many minutes?
6. How many minutes in $\frac{1}{2}$ of an hour?
7. If it takes 5 seconds to write one line, how many lines can be written in 1 minute?
8. How many hours in $\frac{1}{4}$ of a day?
9. When the sun rises at 6 o'clock in the morning and sets at 6 o'clock in the evening, how many hours does the sun shine?
10. At 12 cents an hour, how many hours will it take to earn 48 cents? To earn 60 cents? To earn 36 cents.
11. Harvey works on a farm for $5 and board and clothing a month. How much money does he get in a year?
12. How many months in 4 years?
13. 35 days equal how many weeks?
14. How many school days in 11 weeks?

1. How many quarts in 648 pints? In 374 pts.?
2. A barrel of kerosene contained 208 qts. How many gallons was that?
3. A common barrel contains $31\frac{1}{2}$ gallons. How many quarts does it contain?

REMARK.—Add $\frac{1}{2} \times 4$ (or 4 halves = 2) to 31×4.

4. A cistern that will contain 152 barrels is $\frac{1}{4}$ full. How many barrels of water in the cistern?
5. How many minutes in 5 hours?

LESSON LXXXVIII.

1. How many weeks in 4 years?
2. There are 320 weeks of school in 8 years. James was in school only $\frac{1}{4}$ of the time. How many weeks was he in school?
3. Mr. Reed receives $1 for 5 hours' work. How many dollars does he receive for 2580 hours' work?
4. A certain family uses 365 qts. of milk in 1 year. What does it cost that family for milk at 5c. a quart?

REMARK.—To change cents to dollars, put a period to the left of the two right hand figures and $ before the number; 1225c. = $12.25.

5. Multiply 257 by 4 and divide the result by 3.

1. $10 was paid for 3 sheep. What was the cost of one?

REMARK.—One sheep cost $\frac{1}{3}$ of $10, which is $3\frac{1}{3}$.

2. I bought 2 barrels of apples for $5. What did I pay a barrel?
3. Jane paid $5 for 4 books. What was the cost of one book?
4. A tailor bought 5 yards of cloth for $12. Find the cost a yard?
5. Four hogs were bought for $25. What was paid for each hog?
6. I paid 37c. for 4 pints of ice cream. What was the cost a pint?
7. A farmer bought 3 pairs of boots for $13. How much a pair did he pay?
8. A mason earned $18 in 5 days. What were his daily wages?
9. I put 9 pints into 2 jugs. How many pints did each jug hold?
10. How many bunches of beets, at 4c. a bunch, can be bought for 25c.?
11. Kate paid 33c. for 5 spools of silk. What was the cost of 1 spool?
12. At $3 a yard, how many yards of cloth can be bought for $22? For $29?

1.	*2.*	*3.*	*4.*	*5.*
2)156	2)132	2)116	2)174	2)198

78

Proof: { Quotient × Divisor = Dividend.
78 × 2 = 156

6.	*7.*	*8.*	*9.*	*10.*
3)234	3)252	3)275	3)291	3)405

LESSON XCI.

1.	*2.*	*3.*	*4.*	*5.*
4)$300	4)$312	4)$548	4)$536	4)$616

6.	*7.*	*8.*	*9.*	*10.*
5)325	5)410	5)445	5)640	5)785

LESSON XCII.

1.	*2.*	*3.*	*4.*	*5.*
2)114	3)204	4)356	5)630	2)354

6.	*7.*	*8.*	*9.*	*10.*
4)704	5)620	2)530	3)792	4)904

11.	*12.*	*13.*	*14.*	*15.*
2)506	3)834	4)712	5)965	2)956

1. What is $\frac{1}{2}$ of \$20? $\frac{2}{2}$ of \$12? $\frac{1}{2}$ of \$16?
2. What is $\frac{1}{3}$ of 18c.? $\frac{2}{3}$ of 18c.? $\frac{3}{3}$ of 24c.?
3. What is $\frac{1}{4}$ of 28 eggs? $\frac{2}{4}$? $\frac{3}{4}$? $\frac{4}{4}$?
4. What is $\frac{1}{5}$ of 35 pints? $\frac{2}{5}$? $\frac{3}{5}$? $\frac{4}{5}$? $\frac{5}{5}$?
5. Of what number is three one third? Is 4 one fourth? Is 5 one fifth? Is 9 one half? Is 6 one fifth? Is 9 one fourth? Is 7 one fifth? Is 11 one third? Is 12 one fifth? Is 12 one fourth? Is 8 one fifth? Is 11 one half? Is 8 one third? Is 11 one fifth?
6. Of what number is 9 three thirds? Is 12 three fourths? Is 20 four fifths? Is 10 one half? Is 60 five fifths? Is 36 three fourths? Is 48 four fourths? Is 40 four fifths? Is 24 two thirds? Is 21 three fourths? Is 32 four fifths? Is 16 four fifths?

COMPLETE AT SIGHT.

7. $2)\underline{\quad}\ 6$ $\quad 2)\underline{\quad}\ 4$ $\quad 3)\underline{\quad}\ 9$ $\quad 2)\underline{\quad}\ 8$ $\quad 4)\underline{\quad}\ 12$

8. $\frac{20}{5}$ $\frac{24}{6}$ $\frac{35}{7}$ $\frac{40}{5}$ $\frac{32}{8}$ $\frac{50}{10}$ $\frac{48}{12}$ $\frac{29}{9}$

9. $\frac{18}{\quad} = 3$ $\quad \frac{\quad}{7} = 4$ $\quad \frac{\quad}{5} = 8$ $\quad \frac{\quad}{3} = 12$ $\quad \frac{\quad}{6} = 4$

10. $27 \div 9 = ?$ $\quad 50 \div 10 = ?$ $\quad 32 \div 8 = ?$

1. A farmer had 315 bushels of potatoes. If he should put them in barrels, each holding 3 bushels, how many barrels would he need?
2. 365 days equal one year. How many days in $\frac{1}{5}$ of a year?
3. Find the cost of 1 lot, if 3 lots cost $561.
4. The distance from Henry's home to the school-house and back is 2416 yards. How far does he live from the school-house?
5. A man has 155 acres in 3 farms of equal size. How many acres in each farm?

LESSON XCV.

1. Three men did a piece of work for $786. How much did each man earn?
2. Two lots cost $5424. What is the price of each?
3. A man bought a house and lot for $7558. The house was considered worth as much as the lot. What was the value of the house?
4. Multiply 358 by 3 and divide the product by 5.
5. Find 5 times $496.
6. Find the sum of 4 thousand 3 hundred 5, 2 thousand 1 hundred 23, 7 hundred sixty and 49.

1. Multiply the following numbers by 2; by 3; by 4; by 5:

   7, 4, 10, 3, 5, 9, 1, 8, 0, 2, 6, 11, 12, 20, 5, 40, 10, 50, 9, 8, 30, 100, 7, 12, 11.

2. $\frac{1}{2}$ of what equals 5 tulips? Equals 9 roses?
3. $\frac{1}{3}$ of what equals \$7? Equals \$11?
4. $\frac{1}{4}$ of what equals 6 pegs? Equals 8 cents?
5. $\frac{1}{5}$ of what equals 12 lilies? Equals 9 dolls?
6. What is the product of 8 and 5? 7 and 4? 12 and 3? 5 and 9? 7 and 3? 2 and 9? 4 and 11? 5 and 12? 10 and 4? 8 and 3? 4 and 12? 6 and 3? 9 and 4? 3 and 9? 4 and 5? 7 and 2? 12×2? 10 and 0? 5 and 11? 7 and 4? 1×12?
7. Find the quotient of 15 and 5; 40 and 8; 24 and 6; 35 and 7; 44 and 4; 60 and 5; 30 and 10; 32 and 4; 27 and 9; 5 and 20; 4 and 24; 7 and 28; 6 and 18; 3 and 15; 2 and 14; 21 and 7; 11 and 33.
8. What is $\frac{1}{4}$ of 24? $\frac{2}{4}$ of 24? $\frac{3}{4}$ of 24? $\frac{1}{3}$ of 27? $\frac{2}{3}$ of 18? $\frac{2}{5}$ of 30? $\frac{4}{5}$ of 30? $\frac{1}{2}$ of 22? $\frac{1}{3}$ of 36? $\frac{1}{4}$ of 44? $\frac{3}{4}$ of 44? $\frac{1}{5}$ of 60? $\frac{3}{5}$ of 60? $\frac{4}{5}$ of 40? $\frac{2}{3}$ of 27? $\frac{2}{4}$ of 36?
9. The product of what two numbers equals 27? 32? 40? 21? 48? 55?

REVIEW—ORAL.

1. How many pints in 1 quart? 10 quarts?
2. 24 pints equal how many quarts? 36 pints equal how many quarts?
3. How many dimes equal one dollar? $5?
4. $\frac{1}{5}$ of a minute equals how many seconds?
5. How many hours in $\frac{1}{3}$ of a day and night?
6. 35 days are how many weeks?
7. I bought 35 cents worth and gave the clerk a half dollar. What change should I receive?
8. How many pounds of white fish, at 8 cents a pound, can be bought for 40 cents?

LESSON XCVIII.

REVIEW—WRITTEN.

1. A farmer who has 498 acres divides his land into 3 equal farms. What is the size of each?
2. If one barrel of oranges is worth 3 barrels of apples, how many barrels of oranges are worth 465 barrels of apples?
3. 1234 is how many 3's? How many 5's?
4. 5 bushels of potatoes cost $5. What was the price per bushel?
5. How many pint bottles can be filled from 408 quarts?

1. What is the cost of 8 pounds of oatmeal at 5 cents a pound?
2. I owe one man $40, another man $15, and a third man $20. How much do I owe?
3. Mr. Dexter bought a cow for $55, and, after keeping her one year, sold her for $7 less than he paid for her. For how much did he sell her?
4. I paid 35c. for 7 pounds of rosin. Find the price of one pound?
5. John has 3 brothers and 4 sisters. He gave each 5 cents. How much did he give all?
6. Mr. Day buys 5 tons of hay to keep his cow one year. If he pays $11 a ton, what is the cost?
7. A man's wages are $5 a day. How much does he receive for two weeks' work, if he does not work on Sunday?
8. It takes one man 45 days to do a piece of work. In how many days can 5 men do the same work?
9. Find the cost of one cap if 5 caps cost $25.
10. A man bought 4 coats for $44. What was the price of one coat?
11. If one orange is worth as much as 4 apples, how many oranges can be had for 36 apples?

FIND REMAINDERS BY ADDITION.

1. 27 and how many are 83?

83	Min.
27	Sub.
56	Rem.

REMARK: Instead of subtracting 7 from 13, say 7 and how many are 13? Write 6 in the remainder and add 1 ten (of the sum 13) to the next figure in the subtrahend. 1 and 2 are 3, and how many are 8? Write 5 as the other figure of the remainder.

2. Out of \$2.50 take the sum of 85c. and 32c.

\$2.50	Min.
.85	Sub.
.32	Sub.
\$1.33	Rem.

REMARK: Instead of subtracting the sum of 85 and 32, say 5 + 2 are 7, and how many are 10? Write 3 in the remainder and add 1 (ten) to the next column. 1 + 3 + 8 are 12, and how many equal 15? Write 3 in the remainder. 1 (carried) and how many are 2? Write 1 in the remainder. \$1.33 is the required change.

Min.	\$2.00	\$3.50	\$5.00	\$5.00	\$5.50
Sub.	.45	1.25	2.60	3.75	4.25
Sub.	.63	1.87	.86	.82	.69
Rem.	.92				

Min.	\$8.75	\$9.50	\$12.00	\$13.00	\$15.00
Sub.	5.25	4.25	5.35	5.50	8.45
Sub.	2.95	4.73	4.86	7.75	5.91

1. How many are 2 times 475 oxen? Prove.

PROOF: *Product ÷ Multiplier = Multiplicand:* $950 \div 2 = 475$.

2. How many are 2 times 648 plums?
3. How many are 3 times 846 acres?
4. How many are 4 times 789 cows?
5. How many are 5 times 896 men?

LESSON CII.

1. How many are 2 times 379 books?
2. How many are 5 times 425 boys?
3. How many are 3 times 365 days?
4. How many are 4 times 537 oxen?

LESSON CIII.

1. Divide \$424 by 2; and prove.
2. Divide \$369 by 3; and prove.
3. Divide \$488 by 4; and prove.
4. Divide \$550 by 5; and prove.

LESSON CIV.

1. Divide \$3546 into 2 equal parts.
2. Divide \$5475 into 3 equal parts.
3. Divide \$7500 into 4 equal parts.
4. Divide \$9975 into 5 equal parts.

Find the result and prove it correct.

	2's in	3's in	4's in	5's in	3 times	4 times
1.	174	153	244	345	48	27
2.	648	189	284	700	96	39
3.	372	366	372	909	75	74
4.	556	819	896	376	43	58
5.	334	435	740	483	89	65
6.	744	786	696	971	27	96
7.	872	390	948	835	49	98
8.	990	552	876	776	56	146
9.	778	624	936	904	74	283
10.	462	789	820	944	86	375
11.	542	211	204	260	125	486
12.	334	444	548	457	246	763
13.	780	568	100	333	783	551
14.	646	749	332	443	875	598
15.	124	235	664	678	780	765
16.	374	434	548	765	540	888
17.	392	651	764	234	983	999
18.	756	745	548	321	791	707
19.	484	764	976	543	686	660
20.	790	444	772	907	748	567
21.	004	566	896	678	893	789
22.	070	784	780	888	241	909
23.	900	483	472	777	347	204
24.	634	634	408	666	368	376

TEST EXAMPLES—ORAL.

1. How many books cost \$36, if one book costs \$4?
2. One man can dig a ditch in 24 days. How many men can dig it in $\frac{1}{3}$ of the time?
3. What is the cost of a cow if $\frac{1}{4}$ of the price is \$8?
4. 5 gallons of oil is $\frac{1}{5}$ the number of gallons in a barrel. How many in the barrel?
5. A pint of water weighs about 1 pound. How many pounds in a ten-quart pail full of water?
6. A girl with a 7-pound package in her arm weighs 62 pounds. What is the weight of the girl?
7. Arthur, Tom and James paid 27 cents for a melon, which they shared equally. How much ought each to pay?
8. How many horses can be shod with 36 horse-shoes?
9. If one yard of cloth costs \$5, how many yards will cost \$45?
10. If I have 18 cents and buy 2 pounds of sugar at 8 cents a pound, how much money have I left?
11. How many are 7×4? 3×8? 6×4? 9×2? 5×4? Five 12's? Four 8's? $36 \div 4$? $40 \div 5$? 5×12? Four 9's? Nine 5's?

1. Find the difference between $975 and $466.
2. Find the product of 462 and 5.
3. What is ¼ of $2484?
4. At $3 apiece, how many books can be bought for $327?
5. At $5 a pair, how many pairs of boots can be bought for $475?
6. Find the cost of 3 horses, at $250 each.

LESSON CXIII.

1. There are 24 sheets of paper in a quire. How many sheets in 5 quires? How many sheets in three times as many quires?
2. In a ream of paper there are 480 sheets. How many sheets in 5 reams? How many sheets in ½ of 1 ream?
3. A man went up a ladder that has 34 rounds. He came down after some tool, went up, and at noon came down. How many steps did he take upon the ladder?
4. A barrel of flour contains 196 lbs. If one pound is put into a loaf of bread, how many loaves can be made of 3 barrels of flour?
5. What is the value of the loaves at 5c. each?

TEST EXAMPLES—ORAL.

1. Five pieces of carpet of equal length contain 35 yards. What is the length of one piece? 5 yards is what part of the whole?
2. If 5 hogs cost $30, what part of $30 is the cost of one hog?
3. $36 is the price paid for 4 coats. The cost of one coat is what part of $36?
4. $45 are five fifths. How many dollars are one fifth?
5. Of what number is 12 one fourth?
6. Eight and what number equal 73?
7. The subtrahend is 15 and the remainder is 12. What is the minuend?
8. The product of two numbers is 55. One of them is 11. What is the other?
9. Make an example in subtraction and show how to prove the answer correct.
10. What is the price of one sheep, if I buy 7 for $21?
11. Eleven 3's and how many are 37?
12. 34 is how many less than five 8's?
13. A boy drives the cow twice a day to be milked. How many trips does he make in a week?
14. If a boy earns $7 a week, in what time can he earn $35?

1. How many days in the first six months of the year? Three of these months have 31 days each; two have 30 days each; the other has 28 days.
2. How many more days would there be in the first six months, if each month had 31 days?
3. How many days in the 12 months?
4. A steamboat made a trip of 825 miles in 3 days. How many miles did she run a day?
5. How many miles could the steamer make in 5 days?

LESSON CXVI.

1. In how many days can 5 men do the work that one man can do in 835 days?
2. The sum of two numbers is 846, and one of the numbers is 368. What is the other?
3. What is the minuend, if the subtrahend is 753 and the remainder is 1269?
4. If it takes 5 bushels of wheat to yield a barrel of flour, which is 196 pounds, how many pounds of flour does one bushel yield?
5. The multiplicand is 945 and the multiplier is 4. What is the product?

1. The product is 3635 and the multiplier is 5. What is the multiplicand?
2. The quotient is 375 and the divisor 3. What is the dividend?
3. The divisor is 4, the quotient is 478, and the remainder is 3. What is the dividend?
4. I have 875 acres of land. I wish to divide it into 5 equal fields. How many acres will each field contain?
5. I have a tank that contains 104 gallons of oil. How many days will this oil last if I burn 1 quart a day?

LESSON CXVIII.

1. If Jane makes 4 stitches in a minute, how many can she make in 1 hour?
2. Which number is nearer to 525; 17 or 940?
3. I have a coin, and on it is stamped 1799. How many years ago was it made?
4. The fare, at 3 cents a mile, from Chicago to Springfield, is 564 cents. How many miles from Chicago to Springfield?
5. A book agent gained $2 on each book. He sold 4 books on a certain day. How much did he make on that day?

1. How long a string will it take to go around a house 36 feet long and 28 feet wide?
2. Find the sum of all the numbers between 298 and 304.
3. Mr. Dare sold 2 old stoves weighing 578 pounds. He received 3 cents a pound for them as old iron. How much money did he get for them?
4. A man bought 5 horses, paying $145 apiece for them. Two of them died. How many dollars did his loss amount to?
5. At 5 cents on $1, what will be the interest on $855?

LESSON CXX.

1. I received cash during the day, $236, and paid out $171. How much have I on hand?
2. Mr. Warren sold, for $5115, a house and lot that cost him $4346. Find his gain or loss?
3. At 5 cents a pound, how many pounds of sugar in a barrel that cost $16?
4. Four persons paid $1456 for board and rooms a year. How much did each pay?
5. A clerk, selling cloth at $2 a yard, received $516 in one day. How many yards did he sell?

1. If a man earn $3 a day, how much will he earn in 5 days?
2. A gardener has 2376 pounds of seed, which he puts up in 3-pound sacks. How many sacks can he fill?
3. How many feet long is a block of houses whose length is 225 yards?
4. A, B and C own 1876 acres of land. A owns $\frac{1}{4}$ of it. How many acres does he own?
5. How many acres do B and C own?

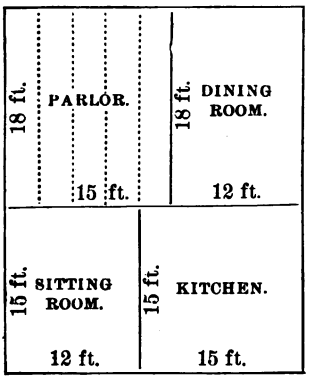
LESSON CXXII.

1. If a man saves $3 a week, in how many weeks can he save enough money to pay for his house, on which he owes $2,400?
2. A man paid $875 for a lot, and 4 times as much money for a house. What was the cost of the house?
3. A man left $2347 to one son, $2568 to another son, $1995 to a third son, $1675 to his daughter Anne, and $1385 to his daughter Ella. He left to his wife $\frac{1}{2}$ as much as to all the children. How much did he leave to his children? How much did he leave to his wife?

1. How many years since the discovery of America in 1492?
2. What number must be subtracted from 5 times 947 to leave a remainder of 846?
3. In what time can a man earn $261 if he earns $3 a day?
4. If a number of chickens be fed 4 ears of corn a day, how many ears will last them one year, that is, 365 days?

LESSON CXXIV.

1. Here is a plan of the lower story of a small house. Make a drawing like it.
2. How many feet of picture molding will reach around each room? Around all the rooms?



3. How many widths of carpet, one yard wide, will cover the parlor floor?
4. How many yards in length of carpet, one yard wide, will cover the parlor floor?

1. If one hill is 759 feet high, and another hill is 241 feet higher, how high is the second hill?
2. If a carriage is worth $630, and a horse one half as much, how much is the horse worth?
3. A grocer bought 5 barrels of oil, each barrel containing 51 gallons. How many gallons did he buy?
4. Find the number of 4's in 756.
5. By what must 5 be multiplied to make a product equal to 1245?
6. $68 \times 5 \times 4 \times 3 \times 2 = ?$

LESSON CXXVI.

1. Mr. Taylor paid $4872 for his house and lot, which was three times what I paid for mine. What did mine cost?
2. Mr. Gates sold his horse for $350, which was one third as much as I sold mine for. For how much did I sell my horse?
3. New York is 960 miles from Chicago. How many miles does a man travel in going from one city to the other and back?
4. Add $374 to $654.

1. Find the entire weight of the boys in the class; of the girls in the class.
2. How many strips a yard wide will cover the floor of this school-room?
3. How many girls and boys would be in this room, if there were 5 times as many boys and 4 times as many girls?
4. How many pages in your reader? How many pages in a book that has three times as many pages?
5. How many pages in all your school books?

LESSON CXXVIII.

1. How many desks in this school-room? How many feet have all these desks?
2. How many screws did it take to fasten them properly to the floor?
3. Find the number of panes of glass in this room. How many edges have all the panes?
4. If it required 4 "tins" for each edge to fasten the panes, how many "tins" were used?
5. Suppose the boys of this room wished to buy a foot-ball, and each should bring 5 cents. How much money would be raised?

1. How many years since the Declaration of Independence, in 1776?
2. A man had a farm of 640 acres and sold $\frac{1}{4}$ of it. How many acres did he sell?
3. How many acres of land worth $5 an acre can be bought for $950?
4. If the expense of a family is $1200 for 3 months, what is their expense for 1 month?
5. Mr. A's farm of 960 acres contains 4 times as many acres as Mr. B's. How many acres does Mr. B's contain?

LESSON CXXX.

MAKING CHANGE.

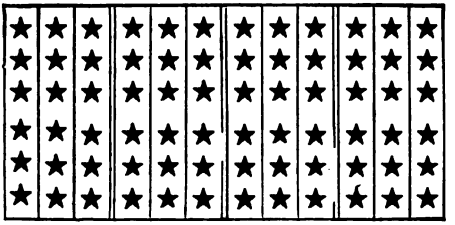
1. I bought 3 pounds of oatmeal, at 6c. a pound, and gave the grocer a half dollar to pay for it. How does he count the change, and how much does he give me?

   REMARK—He will probably give me the oatmeal, counting it 18c. and placing in my hand 2c., 5c. and 25c., he would say: 20, 25, 50, thus giving me in change 32 cents.

2. Having only 1c., 5c. and 10c. pieces, make change for 34c. out of $1, 58c. out of $1, etc.

THIRD GRADE.

LESSON I.



1. Count the stars in the first column.
2. How many stars in two columns? How many are 6 and 6? How many 6's in 12? How many times is 6 contained in 12? 12 less 6 = ?
3. How many stars in 3 columns? 12 and 6 are how many?
4. How many 6's in 18? What is $\frac{1}{6}$ of 18? 18 less 6 = ? What part of 18 is 3? 6? $6 \times 3 = ?$
5. How many stars in 4 columns? $18 + 6 = ?$ How many 6's in 24? What is $\frac{1}{6}$ of 24? 24 less 6 = ? $6 \times 4 = ?$
6. How many stars in 5 columns? 6 columns? 7 columns? 8 columns? 9 columns? 10 columns? 11 columns? 12 columns?
7. How many 6's in 30? 36? 42? 48? 60? 54? 66? 72?
8. What is $\frac{1}{6}$ of 36? 30? 42? 48? 60? 66? 54? 72?
9. 2 is $\frac{1}{6}$ of what number? 3? 4? 6? 5? 7? 8? 10? 9? 12?
10. Read at sight the sums from left to right, then from right to left. The differences in the same way?
11.

12	24	18	30	42	36	54	48	60	66
6	6	6	6	6	6	6	6	6	6

60 seconds = 1 minute.
60 minutes = 1 hour.
24 hours = 1 day.

1. Add downward, upward, to the right by lines, to the left:

6	6	6	3	6	6	2	3	4	5
6	2	1	6	4	2	6	6	5	6
6	6	6	1	6	1	6	6	1	2
6	6	6	6	6	6	5	6	3	6
6	6	6	6	6	6	4	1	6	6
1	3	4	5	2	6	6	5	6	3

2. Read the quotients:

$\frac{24}{6}$	$\frac{18}{6}$	$\frac{36}{6}$	$\frac{12}{6}$	$\frac{42}{6}$	$\frac{60}{6}$	$\frac{54}{6}$	$\frac{66}{6}$	$\frac{72}{6}$

3. Read the products and sums:

3	1	2	5	6	9	7	8	4	10	12	11
6	6	6	6	6	6	6	6	6	6	6	6

4. If a box of oranges cost \$6, what will 3 boxes cost? 5 boxes? 7 boxes? 8 boxes? 9 boxes? 12 boxes?
5. At \$6 a barrel, what part of a barrel of flour can be bought for \$1? \$2? \$4? \$5?
6. If one yard of cloth cost \$6, what will 4 yards cost?
7. What is $\frac{1}{6}$ of \$12? $\frac{2}{6}$? $\frac{3}{6}$? $\frac{4}{6}$? $\frac{5}{6}$?
8. What is $\frac{1}{6}$ of 18 cars? $\frac{2}{6}$? $\frac{3}{6}$? $\frac{4}{6}$? $\frac{5}{6}$?
9. What is $\frac{1}{6}$ of 36 lemons? $\frac{2}{6}$? $\frac{4}{6}$ $\frac{5}{6}$?
10. What is $\frac{1}{6}$ of 30 barrels? $\frac{3}{6}$? $\frac{2}{6}$? $\frac{5}{6}$? $\frac{4}{6}$?
11. What is $\frac{1}{6}$ of 54 bushels? $\frac{2}{6}$? $\frac{3}{6}$? $\frac{4}{6}$? $\frac{5}{6}$?
12. What is $\frac{1}{6}$ of 72 cents? $\frac{2}{6}$? $\frac{4}{6}$? $\frac{3}{6}$? $\frac{5}{6}$?
13. How many seconds in $\frac{1}{6}$ of a minute? $\frac{2}{6}$? $\frac{3}{6}$?
14. How many hours in $\frac{1}{6}$ of a day? $\frac{2}{6}$? $\frac{3}{6}$? $\frac{5}{6}$?
15. What part of a day between 6 o'clock and 12 o'clock?

1. Find the cost of 6 hats, at $5 each.

   REMARK. *6 times $5 = cost of the 6 hats = $30, or $5 × 6 = $30.*

2. Arthur lost 6 marbles, which was $\frac{1}{6}$ of all he had. How many marbles had he?
3. Ida's hat cost $6, and her cloak 3 times as much. How much did the cloak cost? How much did both cost?
4. 6 blocks is what part of 36 blocks?
5. In an orchard are 6 rows of trees, and 8 trees in a row. How many trees in the orchard?
6. At $6 a ton, what will 9 tons of coal cost? 5 tons? 7 tons?
7. If 6 acres of land cost $72, what will 1 acre cost.

   REMARK. *$72 ÷ 6 = cost of one acre = $12.*

8. A man received $18 for a week's work. What did he earn in one day?
9. 24 equals how many 6's? 6 is $\frac{1}{6}$ of what number?
10. 12 equals how many 6's? 9 is $\frac{1}{6}$ of what number?
11. 42 equals how many 6's? 11 is $\frac{1}{6}$ of what number?
12. 54 equals how many 6's? 12 is $\frac{1}{6}$ of what number?
13. 13 equals how many 6's? 32 equals how many 6's?

    REMARK. *13 = 6 + 6 + 1; therefore, 13 = two 6's and 1 remainder. 32 = 6 + 6 + 6 + 6 + 6 + 2; therefore, 32 = five 6's and 2 remainder.*

14. 25 equals how many 6's? 35 = how many 6's?
15. 57 equals how many 6's? 14 = how many 3's?
16. 19 equals how many 6's? 17 = how many 5's?
17. 28 equals how many 6's? 40 = how many 6's?
18. $\frac{1}{6}$ of 25 weeks? 60 minutes? 18 hours? 30 seconds?
19. $\frac{1}{6}$ of $48? 42 dimes? 54 cents? 72 "nickels"?
20. $\frac{1}{3}$ of 30 lemons? 18 days? 12 trees? 15 books?
21. $\frac{1}{2}$ of 12? $\frac{1}{3}$ of 18? $\frac{1}{4}$ of 24? $\frac{1}{5}$ of 30?

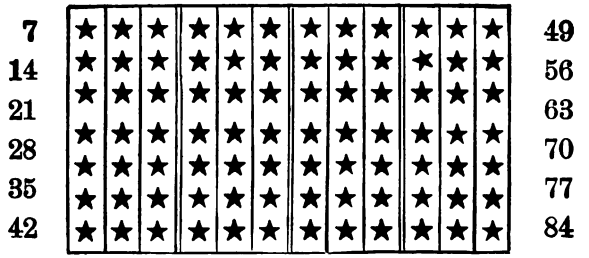
1. How many hours in 6 days? 6 hours is what part of a day?
2. Find the cost of one sheep, if 6 sheep cost $24.
3. 6 minutes is what part of an hour?
4. If 6 hogs cost $42, what is the cost of one hog?
5. One man built a fence in 66 days. How many men could have built it in 6 days?
6. Six windows contain 48 panes. How many panes in one window?
7. Cost of 9 pounds of cheese, at 6 cents a pound?
8. Cost of 12 cords of wood, at $6 a cord?
9. Cost of 5 yards of cloth, at $6 a yard?
10. At $6 a barrel, how many barrels of flour can be bought for $72?
11. The interest of $8 is 48 cents. What is it on $1? $2?
12. If the interest on $1 is 6c. What will it be on $9?
13. How many minutes in $\frac{1}{6}$ of an hour? How many hours in $\frac{1}{6}$ of a day?
14. A lady paid $25 for a dress, $6 for a pair of shoes and $6 for a hat. How many dollars did she spend?
15. A man owed a debt of $42; he paid $30. How much did he still owe?
16. A man having $24, paid $6 for a hat. How much had he left?
17. If 6 chickens cost $1, how much will 12 chickens cost? 30 chickens? 48 chickens? 36 chickens? 72 chickens?
18. Six boys earn $1 in one hour. How much will 30 boys earn in the same time? 54 boys? 42 boys? 6 boys in two hours?
19. 24 melons separated into groups of 4 each will make how many groups? How many groups of 6 melons each?

1. Henry bought 6 collars at 8 cents each. He gave the clerk 50 cents. How much in *change* should Henry receive?
2. What cost 6 pounds of butter, at 11 cents a pound?
3. An orchard having 54 trees in 6 rows, has how many trees in a row?
4. There are 72 books on 6 shelves. How many on a shelf?
5. A cow gives 6 quarts of milk twice a day. How much is that in 6 days?
6. If it costs 60 cents to laundry 6 shirts, what will it cost to laundry 1 shirt? 5 shirts?
7. Find the cost of 8 boxes of meat at $6 a box?
8. James had 42 hens. $\frac{1}{6}$ of them died. How many remained alive?
9. I went to the store with 36 cents, and paid out all but 30 cents. What part of my money did I spend?
10. One pair of boots is what part of 12 boots?

COPY AND FIND THE PRODUCTS.

1.	2.	3.	4.
15 cards	35 sheets	6 tacks	$125
3	4	5	6

5.	6.	7.	8.
48 needles	89 cups	76 tools	$125
5	6	4	5



1. Count the stars in one column.
   How many are 7 and 7? How many 7's in 14?
   What is $\frac{1}{2}$ of 14? $\frac{1}{7}$ of 14? $7 \times 2 = ?$
   How many times is 7 contained in 14? 14 less 7 = ?
2. How many stars in 3 columns? 14 and 7 = ?
   How many 7's in 21? What is $\frac{1}{3}$ of 21?
   What is $\frac{1}{7}$ of 21? How many times can you take 7 from 21?
   How many times is 7 contained in 21? $7 \times 3 = ?$
   What part of 21 is 3? 7 is what part of 21?
3. How many stars in 4 columns? 5 columns? 6 columns? 7 columns? 8 columns? 9 columns? 10 columns? 11 columns? 12 columns?
4. How many are 21 and 7? 28 and 7? 7 + 35? 7 + 42? 56 and 7? 63 and 7? 77 and 7? 70 and 7? 49 and 7?
5. How many 7's in 14? 21? 28? 35? 42? 49? 56? 63? 70? 77? 84?
6. What is $\frac{1}{7}$ of 21? 14? 35? 28? 42? 70? 49? 56? 63? 79? 84? 77?
7. 4 is $\frac{1}{7}$ of what number? 2? 3? 5? 6? 8? 7? 9? 11? 12? 10? 1? 4?
8. Read at sight the sums from left to right, then right to left. Name the differences in the same order.

21	14	35	28	42	56	49	84	77	63
7	7	7	7	7	7	7	7	7	7

7 days = 1 week.
4 weeks = 1 month (nearly).
12 months = 1 year.

1. Add rapidly downward, upward, to the right, to the left:

7	7	7	6	4	5	3	2	7	7
7	7	1	2	3	4	5	6	7	7
7	7	5	6	7	3	7	5	4	8
7	6	4	7	7	7	6	7	5	4
7	5	6	4	5	7	7	7	6	5
7	7	7	7	6	6	4	3	7	6
7	4	3	3	2	2	7	4	7	1

2. Name the quotients at sight:

$$\frac{14}{7} \quad \frac{28}{7} \quad \frac{56}{7} \quad \frac{21}{7} \quad \frac{42}{7} \quad \frac{84}{7} \quad \frac{35}{7} \quad \frac{70}{7} \quad \frac{63}{7}$$

3. Name the products, sums, differences:

5	4	6	3	7	8	10	12	11	9	2	1
7	7	7	7	7	7	7	7	7	7	7	7

4. 14 equals how many 7's? $\frac{1}{7}$ of 28 equals what?
5. 56 equals how many 7's? $\frac{1}{7}$ of 35 equals what?
6. 84 equals how many 7's? $\frac{1}{7}$ of 63 equals what?
7. 49 equals how many 7's? $\frac{1}{7}$ of 77 equals what?
8. 15 equals how many 7's? 9 is $\frac{1}{7}$ of what number?
9. 25 equals how many 7's? 8 is $\frac{1}{7}$ of what number?
10. 47 equals how many 7's? 5 is $\frac{1}{7}$ of what number?
11. 80 equals how many 7's? 7 is $\frac{1}{7}$ of what number?
12. 49 is how many more than 35? Than 28?
13. 67 is how many more than 47? Than 63?
14. 13 is how many less than 56? Than 49?
15. 20 is how many less than 84? Than 70?

1. If a pair of boots cost $7, what will 4 pairs cost? 8 pairs?
2. There are six working days in a week. How much will a man receive for one week's work at $7 a day?
3. At $7 a yard, what will 5 yards of cloth cost? 11 yards? 3 yards?
4. If a barrel of flour cost $7, what will 2 barrels cost? 4 barrels? 12 barrels?
5. A bushel of clover seed is worth $7. How many bushels can be bought for $49? $56? $21? $42? $63? $77?
6. What is $\frac{1}{7}$ of 14 barrels? $\frac{2}{7}$? $\frac{3}{7}$? $\frac{5}{7}$? $\frac{6}{7}$? $\frac{4}{7}$? $\frac{7}{7}$?
7. One day is what part of one week? 5 days? 4 days?
   A boy spends 7 hours of a day in study, 7 hours in play, and sleeps remaining time. How many hours does he sleep?
9. A woman received 63 cents for making overalls at 9 cents a pair. How many pairs did she make?
10. A man bought a stove for $35; he paid for it at the rate of $5 a week. How many weeks was he in paying for it?
11. Johnson paid $7 for a vest, and 3 times as much for the coat. How much did the coat cost?
12. Clara bought a paper of 72 pins, and gave away 7. How many pins had she left?
13. 59 dollars is 7 dollars less than what was paid for a sleigh. How much was paid for the sleigh?

14. $\frac{1}{7}$ of 35 weeks? 49 hours? 14 months? 63 days?
15. $\frac{1}{7}$ of $56? $28? $56? 77 cents? 21 "nickels"?
16. $\frac{1}{7}$ of 49 trees? 84 men? 7 houses? 42 cars?
17. 42 are how many 5's? How many 4's? 6's?
18. 63 are how many 10's? How many 11's? 7's? 8's?

1. $85 + 7 = ?$ $129 - 57 = ?$ $37 \times 8 = ?$ $497 \div 7 = ?$
2. $\frac{1}{7}$ of 490 sheep, at \$3 each? \$4 each?
3. \$840 were equally distributed among 7 children. How much did each child receive?
4. James writes 7 lines in his copy-book each day. In how many days will he write 56 lines?
5. One man owes me \$45, another owes me \$7, and another \$6. How much do the three men owe me?
6. Albert is 7 years old and his father is 5 times as old. What is the sum of their ages?
7. A tailor's house rent is \$6 a month and his shop rent \$3. How much rent does he pay in one year?
8. Rufus picks 8 bushels of apples in one hour and Harry 7 bushels. How much do both pick in 8 hours?
9. How many months in 7 years and 7 months?
10. If a girl earns 70 cents in 10 hours, how much will she earn in 6 hours? In 15 hours?
11. At \$7 an acre, how many acres can be bought for \$77? For \$84? For \$210?
12. What cost $\frac{1}{7}$ of 63 yards of cloth at \$6 a yard?
13. 7×4, and $6 = ?$ $49 \div 7$, less $7 = ?$ $7 \times 12 = ?$
14. The front wheels of a carriage have 12 spokes each and the hind wheels have each 14 spokes. How many spokes has the carriage?
15. On a certain street there are 48 numbers to a block. How many numbers to 7 such blocks?
16. One bag of barley weighs 84 pounds. How much will $\frac{1}{7}$ of a bag weigh?
17. A man had 56 cows; he gave $\frac{1}{7}$ of them to his son. How many had he left?
18. How many are $\frac{2}{7}$ of 35? $\frac{5}{7}$? $\frac{4}{7}$? $\frac{6}{7}$?
19. What is the value of 7 bushels of wheat, at 87c. a bushel?

1. If one bushel of chestnuts is worth 7 dollars, how much are 9 bushels worth?
2. How many barrels of flour, at 7 dollars a barrel, may be bought for 56 dollars?
3. How much is paid for a quantity of corn that costs 11 times 7 dollars and 5 dollars more?
4. 63 acres is 7 times what a farmer has planted in wheat. How many acres of wheat has he?
5. One seventh of 77 years is George's age. How old is George?
6. There are 12 inches in one foot. How many inches are there in a line 7 feet long?
7. How much is the rent of a house a month for which there is paid 9 times 7 dollars and 6 dollars more?
8. 61 dollars is 5 dollars more than what 7 tons of coal cost. What is the price of one ton?
9. Mr. Jackson had 7 cows and they averaged each 9 pounds of butter per week. How many pounds of butter did he make in one week?
10. A farmer had all but $\frac{1}{6}$ of 72 acres in wheat. How many acres of wheat had he?
11. In the morning the wind blew at the rate of 7 miles an hour, in the afternoon during a hurricane the rate was increased to 56 miles an hour. How many times faster did it blow in the afternoon?
12. Ames receives 70 cents a day. What will he be paid for $\frac{1}{7}$ of a day?
13. How many are 4×7? 5×6? 9×5? 6×8? 7×9? 9×6?
14. Fred earns 7 cents an hour. How much will he earn in 12 hours?
15. 12 times $\frac{1}{7}$ of \$63 equal how much money?

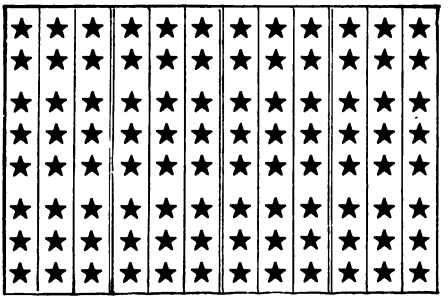
COPY, AND FIND THE PRODUCTS.

1.	2.	3.	4.
28 books	96 pens	84 sheep	$220
5	6	7	4

5.	6.	7.	8.
234 pins	57 cows	69 days	$184
3	7	6	5

9.	10.	11.	12.
286 boys	315 girls	75 men	$169
2	3	7	6

13.	14.	15.	16.
109 axes	208 keys	98 nails	$207
7	4	6	4



1. How many stars in one column? In two columns? How many are 8 and 8? How many 8's in 16? What is $\frac{1}{2}$ of 16? 16 less 8 = ? How many are two times 8? What is $\frac{1}{8}$ of 16?
2. How many stars in 3 columns? 16 and 8? 3 times 8? How many times is 8 contained in 24? 3 is what part of 24?
3. How many stars in 4 columns? 5? 6? 7? 8? 9? 10? 11? 12?
4. How many 8's in 16? 24? 32? 40? 48? 56? 64? 72? 80? 88? 96?
5. What is $\frac{1}{8}$ of 24? 32? 48? 96? 64? 56? 72? 88? 40?
6. Six is what part of 48? 7 of 56? 7 of 49? 10 of 80? 12 of 96?
7. One is $\frac{1}{8}$ of what number? 2? 4? 8? 3? 6? 12? 7?
8. How many times is 8 contained in 32? 24? 40? 56? 64? 72? 96?
9. Read at sight the sums from left to right; from right to left.
10. Read differences in same manner:

32	24	16	48	56	72	64	88	80	40
8	8	8	8	8	8	8	8	8	8

1. Name the quotients:

40/8	64/8	72/8	32/8	56/8	88/8	48/8	96/8	24/8

2. Name the products and sums:

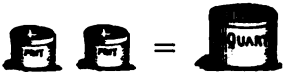
1	2	5	4	6	3	7	8	10	9
8	8	8	8	8	8	8	8	8	8

3. Add downward, upward, to the right, to the left:

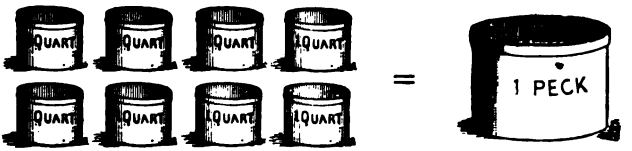
8	8	8	8	8	8	8	8	8	8
8	7	8	6	5	8	1	8	7	3
8	6	7	4	8	6	2	8	7	3
8	5	8	2	8	5	3	8	6	5
8	4	3	7	6	7	4	8	6	5
8	3	4	5	8	3	5	5	4	8
8	2	8	8	7	8	6	6	4	8
7	1	6	8	6	8	7	8	3	7

4. $5 = \frac{1}{8}$ of what? What is $\frac{1}{8}$ of 96? $\frac{1}{8}$ of 72?
5. $9 = \frac{1}{8}$ of what? What is $\frac{1}{8}$ of 32? $\frac{1}{8}$ of 48?
6. $3 = \frac{1}{8}$ of what? What is $\frac{1}{8}$ of 64? $\frac{1}{8}$ of 88?
7. $7 = \frac{1}{8}$ of what? What is $\frac{1}{8}$ of 8? $\frac{2}{8}$ of 40?
8. $11 = \frac{1}{8}$ of what? What is $\frac{1}{8}$ of 80? $\frac{3}{8}$ of 56?

9. 25 equals how many 8's? How many 8's in 43?
10. 76 equals how many 8's? How many 8's in 39?
11. 45 equals how many 8's? How many 8's in 89?
12. 37 equals how many 8's? How many 8's in 50?
13. 60 equals how many 8's? How many 8's in 70?
14. 400 equals how many 8's? How many 8's in 560?
15. 328 equals how many 8's? How many 8's in 818?
16. 287 equals how many 7's? How many 7's in 350?
17. 426 equals how many 6's? How many 6's in 540?

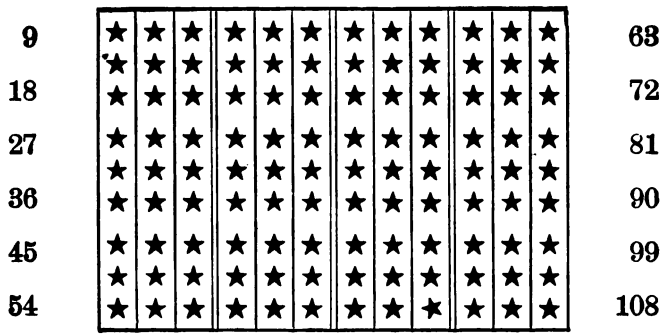


1. How many pints in 2 quarts? 5 quarts? 12 quarts?
2. 18 pints equal how many quarts?
3. Horace earned 56 cents, and gave 8 of them for a lead pencil. How much had he left?
4. Julia planted 65 seeds, and Mary planted 8 less than Julia. How many did Mary plant?
5. There are 9 square feet in one square yard. How many square feet are there in 8 square yards?
6. If a person work 8 hours each day, how many hours will he work in 12 days?
7. A boy was asked how many marbles he had, and replied that if he had 8 times as many, he would have 96. How many marbles had he?
8. If a ship sails 8 miles an hour, in what time, at the same rate, will she sail 88 miles?
9. One eighth of 72 dollars is what a gentleman paid for 2 tickets to the opera. How much did they cost?
10. $8 \times 4 = ?$ $8 \times 7 = ?$ $64 \div 8 = ?$ $96 \div 8 = ?$ $24 \div 8 = ?$
11. If 8 sheep cost \$88, what will one sheep cost?
12. What is the value of $\frac{1}{8}$ of 72 acres at \$6 an acre?
13. At \$12 a month, what is the rent of a house for 8 months?
14. A boy receiving \$12 a week, spends \$4 for board. How much does he save in 8 weeks?
15. A man, being asked the value of his horse, said, one eighth of its value is \$10. What was the horse worth?
16. A boy's coat cost \$8 which was $\frac{1}{7}$ of his money. How much had he?
17. Mabel is 24 years old, and her sister's age is $\frac{3}{8}$ of hers. How old is her sister?



pt. = pint; qt. = quart; pk. = peck.

1. How many quarts in one peck? 2 pecks? 5 pecks? 7 pecks? 6 pecks? 9 pecks? 10 pecks? 12 pecks?
2. At 8 cents a quart, what will 6 quarts of cranberries cost?
3. Paid $56 for 8 tons of coal. How much was that a ton?
4. A boy can run 9 miles in two hours and a dog can run 8 times as fast. How many miles can the dog run in the same time?
5. If 5 men can do a piece of work in 8 days, in how many days can one man do it?
6. If board is $12 a month, what is it for 8 months?
7. How much is hay per ton, if $88 is paid for 8 tons?
8. Bought 8 pounds of coffee for 96 cents. How much was that a pound?
9. If a horse is fed 1 peck a day, how many weeks will 28 pecks last?
10. Twelve quarts of strawberries at 8 cents a quart = ?
11. If 8 men receive $64 for a piece of work. What does each receive?
12. How many pecks in 32 quarts? 72 quarts? 56 quarts?
13. Two quarts of milk a day, at 4 cents a quart, cost how much for one week?
14. What is the cost of a quart of beans, if a peck is worth 48 cents?
15. What is the cost of one pound of tea, if 3 pounds cost 75 cents?



1. How many stars in one column? In two columns? How many are 9 and 9? How many are two 9's? What is $\frac{1}{2}$ of 18? $\frac{1}{2}$ of 18? 2 is what part of 18?
2. How many stars in 3 columns? $9 + 9 + 9 = ?$ How many 9's in 27? What is $\frac{1}{3}$ of 27?
3. How many stars in 4 columns? 5 columns? 6 columns? 7 columns? 8 columns? 9 columns? 10 columns? 11 columns? 12 columns?
4. How many 9's in 18? 27? 36? 45? 63? 54? 72? 90? 81? 99? 108?
5. Two is $\frac{1}{9}$ of what number? 3? 5? 7? 9? 11? 12? 4? 6? 8? 10? 1?
6. Read the sums, then the differences, as before directed:

18	36	42	108	90	86	54	45	27
9	9	9	9	9	9	9	9	9

7. Name the quotients at sight:

27	9	36	45	81	72	108	99	54
9	9	9	9	9	9	9	9	9

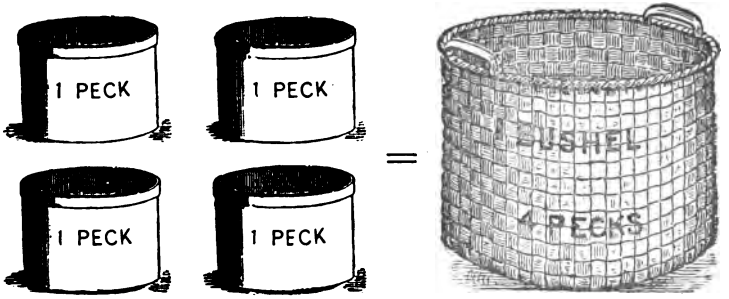
1. Name the products and sums:

4	5	7	6	9	8	5	3	10	12	11
9	9	9	9	9	9	9	9	9	9	9

2. Add downward, upward, rightward, leftward:

9	9	9	9	9	9	9	9	9	9
8	9	7	6	9	4	3	2	1	3
7	8	9	6	5	9	9	8	9	4
6	9	7	9	9	4	3	9	1	6
5	8	9	6	9	9	9	2	9	5
4	9	7	9	5	9	3	9	1	8
3	8	9	6	9	4	9	2	9	7
2	9	7	9	5	9	3	9	1	9
1	8	9	6	9	4	9	2	9	8

3. $3 = \frac{1}{9}$ of what? What is $\frac{1}{9}$ of 36? $\frac{2}{9}$ of 18?
4. $7 = \frac{1}{9}$ of what? What is $\frac{1}{9}$ of 45? $\frac{3}{9}$ of 54?
5. $9 = \frac{1}{9}$ of what? What is $\frac{1}{9}$ of 72? $\frac{4}{9}$ of 27?
6. $11 = \frac{1}{9}$ of what? What is $\frac{1}{9}$ of 81? $\frac{5}{9}$ of 63?
7. $6 = \frac{1}{9}$ of what? What is $\frac{1}{9}$ of 108? $\frac{6}{9}$ of 88?
8. How many 9's in 27? 18? 99? 54?
9. How many 9's in 30? 40? 55? 89?
10. How many 2's in $\frac{1}{9}$ of 108? 3's? 4's? 5's? 6's? 7's?
11. 63 are how many 9's? 8's? 7's? 6's? 5's? 4's? 3's?
12. 50 are how many 9's? 8 is what part of 72?
13. 69 are how many 9's? 12 is what part of 108?
14. 75 are how many 9's? 9 is what part of 81?
15. 95 are how many 9's? 11 is what part of 99?
16. 57 are how many 9's? 7 is what part of 63?
17. $85 are how many $10 bills? $5 is what part of $60?
18. $58 are how many $5 bills? $10 is what part of $70?
19. $93 are how many $1 bills? $9 is what part of $81?



1. James has 69 pecks of corn in one box, and 9 pecks in another. How many pecks of corn are there in the two boxes?
2. Mary had 76 pinks in her garden, and 9 of them were destroyed. How many had she left?
3. A farmer has 12 bushels of wheat, and 9 times as many bushels of oats. How many bushels of grain has he?
4. How much more oats has he than wheat?
5. Of the pupils of a school 6 were absent, and 9 times as many were present. How many were present? How many belonged to the school?
6. At 9 cents a peck, how much will 2 bushels of oats cost?
7. At $9 a bushel, how many bushels of clover seed can be bought for $99?
8. If 9 men can pick 108 bushels of apples in one day, how many bushels can one man pick?
9. What is one quart of beans worth if 9 quarts are worth 72 cents?
10. One ninth of 63 dollars is what John paid for a pair of boots. What did the boots cost?
11. A gentleman earned 9 dollars a day for 8 days, and spent 8 dollars a day for 8 days. How much has he left?

1. At 7 cents a yard, what will 9 yards of ribbon cost?
2. What will 9 cords of wood cost at $5 a cord?
3. The cost of 4 dozen eggs at 9 cents a dozen?
4. Eight books at 9 cents each will cost how much?
5. How long will it take one man to do the work that 9 men do in 11 days?
6. How many sheep can I buy for $96 at $8 each?
7. I have 9 dozen buttons, and need 88 buttons. How many will be left? What did I pay for all of them at 6 cents a dozen?
8. Mr. Hudson had $99. He gave Harold $\frac{1}{3}$ of it and George $\frac{1}{9}$. How much had he left?
9. How many feet in 9 yards? 8 yards? 7 yards? 6 yards?
10. How many feet in 108 inches? In 98 inches?
11. What is the cost of 6 feet of molding, if 9 feet cost 81 cents?
12. How many inches in 3 yards of lead pipe?
13. Willliam earns $\frac{1}{3}$ as much money as his father does, whose wages are $63 a month. How much does William earn?
14. Jane has 11 dollars, and her father has 9 times as much and 8 dollars more. How many dollars has her father? How many dollars have both?
15. Jennie's grandfather is 72 years of age, and she is one-ninth as old. How old is Jennie? In how many more years will she be 17 years old?
16. One seventh of 84 dollars is 3 times the cost of my chair. How much did my chair cost?
17. Sold 12 barrels of flour, worth 6 dollars a barrel, for 69 dollars. How many dollars did I lose?
18. How much more than 46 dollars should a gentleman have in order to buy 12 cords of wood at 5 dollars a cord?

LESSON XX.

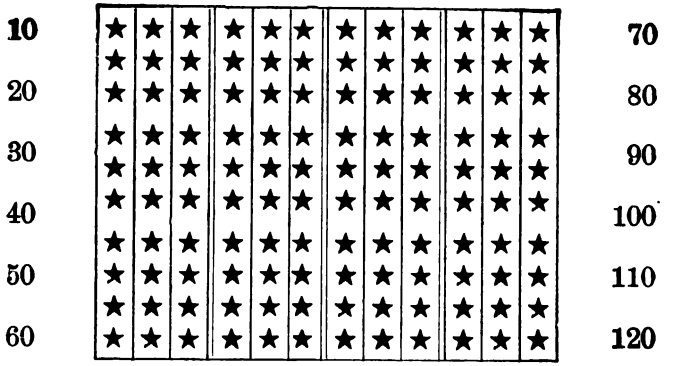
REVIEW—ORAL.

1. How many are three 6's? Six 3's? Four 7's? Seven 5's? Eight 4's? Five 9's? Ten 6's? Six 9's? Eleven 6's? Six 12's? Seven 9's?
2. What is $\frac{1}{6}$ of 18? 30? 48? 36? 54? 42? 72?
3. What is $\frac{1}{7}$ of 28? 21? 42? 56? 49? 63? 84?
4. What is $\frac{1}{8}$ of 24? 32? 48? 64? 56? 72? 96?
5. What is $\frac{1}{9}$ of 36? 18? 72? 99? 81? 63? 45?
6. 3 is what part of 24? Of 21? Of 15? Of 36?
7. $\frac{1}{6}$ of what number is 4? Is 8? Is 9? Is 12?
8. $\frac{1}{7}$ of 35 are how many? $\frac{2}{7}$? $\frac{3}{7}$? $\frac{5}{7}$? $\frac{6}{7}$?
9. 54 are how many 6's? 9's? 5's? 7's? 8's? 10's?
10. 8 what are 24? 40? 72? 96? 64? 56?

LESSON XXI.

REVIEW—WRITTEN.

1. Find the cost of 175 pounds of rice at 7c. a pound.
2. What is the cost of 7 building lots at $1,345 each?
3. Nine pounds of butter at 28c. a pound cost how much money?
4. A certain line of telegraph cost $985 a mile; what did 6 miles of it cost?
5. At $158 an acre, what cost 7 acres?
6. The cost of one house is $1,290. Required the cost of 8 such houses?
7. A steamer sails 275 miles a day. How far will she sail in 9 days?
8. What is a man's income in 6 years at $2,385 a year?
9. Add the product of 497 and 6, to 3,841.
10. Find the cost of 8 chaises at $218 each.



1. How many stars in 1 column? Two columns?
2. Ten and 10 are how many? 20 less 10?
3. How many 10's in 20? What is $\frac{1}{10}$ of 20?
4. How many 10's in 30? 40? 50? 60? 70? 80? 90? 100? 110? 120?
5. What is $\frac{1}{10}$ of 10? 20? 40? 30? 50? 60? 80? 70? 90? 110? 100? 120?
6. 3 is $\frac{1}{10}$ of what? 4? 5? 7? 9? 8? 6? 10? 12? 11?
7. What is $\frac{1}{10}$ of 20 mills? 40 cents? 70 dimes? $90?
8. 10 cts. = what part of a dollar? 40 cts.? 50 cts.? 80 cts.?
9. What is $\frac{1}{10}$ of a dollar? $\frac{3}{10}$? $\frac{4}{10}$? $\frac{6}{10}$? $\frac{7}{10}$? $\frac{9}{10}$?
10. If a man works 10 hours a day, how many hours does he work in one week, not including Sunday?
11. At $10 a head what will 11 head of cows cost?
12. How many cents in $1? $2? How many inches in 10 feet?
13. Mr. Reed had 70 sheep; wolves killed $\frac{2}{10}$ of them. How many were left?
14. If 10c. are paid for the use of $1, how much must be paid for the use of $6? $8? $11? $12? $\frac{1}{2}$?
15. How many men are required to dig a trench in 10 days that one man can dig in 110 days?

11	**33**	**55**	**77**	**99**	**121**
22	**44**	**66**	**88**	**110**	**132**

1. How many are 11 and 11? 22 and 11? 33 and 11?
2. How many 11's in 22? 33? 44? 55? 66? 77? 88? 99? 110? 121? 132?
3. What is $\frac{1}{11}$ of 33? 44? 66? 55? 99? 121? 132?
4. $\frac{1}{11}$ of 22 equals what? $\frac{2}{11}$? $\frac{3}{11}$? $\frac{5}{11}$? $\frac{10}{11}$? $\frac{9}{11}$?
5. 4 is $\frac{1}{11}$ of what number? 3? 5? 10? 12? 11?
6. $\frac{1}{11}$ of 66 desks? 44 feet? 77 inches? $121?
7. $\frac{1}{11}$ of 22 sheep at $7 each? $\frac{2}{11}$ of them at $9 each?
8. I paid $110 house rent, and $\frac{1}{11}$ as much for gas. How much did I pay for both?
9. 3 loads of hay will winter one cow. How many cows will 33 loads winter?
10. Isaac planted 132 seeds in 11 hills. How many seeds did he put into one hill?
11. How many days in 11 weeks and 4 days?

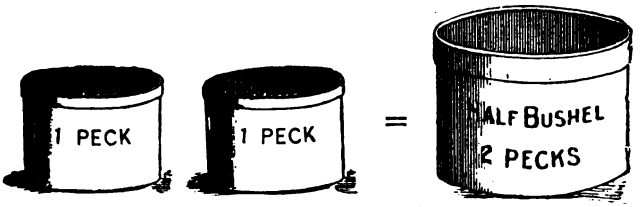
12. 55 equals how many 11's? $\frac{1}{11}$ of 33 equals what?
13. 66 equals how many 11's? $\frac{1}{11}$ of 121 equals what?
14. 110 equals how many 11's? $\frac{1}{11}$ of 99 equals what?
15. 132 equals how many 11's? $\frac{1}{11}$ of 77 equals what?
16. 35 equals how many 11's? 23? 19? 47? 81?
17. 116 equals how many 11's? 67? 76? 130? 113?

18. How many are $\frac{44}{11}$ and 9? $\frac{66}{6}$ and 8? $\frac{110}{10}$ and 7?
19. Eleven times 7 less 4? 11 × 6 less 20? $11 × 10 less $6?
20. Find the cost of $\frac{1}{11}$ of 55 cows, at $12 each.
21. At $12 each, what is the cost of 11 coats?
22. If all but $\frac{1}{11}$ of $99 be divided among 3 persons, how many dollars will each receive?
23. What is the price of $\frac{3}{11}$ of 121 cords of wood, at $5 a cord?

12	36	60	84	108	132
24	48	72	96	120	144

1. How many 12's in 24? 36? 48? 60? 72? 84? 96? 108? 120? 132? 144?
2. What is $\frac{1}{12}$ of 24? 48? 60? 36? 72? 96? 144? 132? 108? 84? 120?
3. 3 is $\frac{1}{12}$ ot what number? 5? 4? 7 6? 9? 8? 10? 11? 12?
4. 24 = how many 12's? 11's? 9's? 8's? 7's? 6's? 5's? 4's?
5. 35 = how many 12's? 11's? 9's? 8's? 7's? 6's? 5's? 4's?
6. 72 = how many 12's? 11's? 10's? 9's? 7's? 6's? 5's? 8's?
7. $\frac{36}{12}$ and 8? $15 + \frac{60}{12}$? 29 less $\frac{84}{12}$? $\frac{132}{11} + 6$?
8. $\frac{1}{12}$ of \$96? \$144? \$120? \$72? \$48? \$132?
9. $\frac{1}{12}$ of 60 books? $\frac{3}{12}$? $\frac{1}{11}$ of 121 sheep? $\frac{1}{3}$ of 72 cows?
10. $\frac{1}{12}$ of 36 acres, at \$11 an acre, equals what?
11. $\frac{1}{11}$ of 77 cows, and 3 cows, at \$12 each, equals what?
12. $132 \div 11 = ?$ $11 \times 11 = ?$ $12 \times 7 = ?$ $96 \div 8 = ?$

13. James is 12 years old, and his father is 4 times as old and 11 years more. How old is his father?
14. How many feet in 132 inches? In 12 yards?
15. A ship sailing 120 miles in 10 hours, sailed how much in 1 hour?
16. Edna bought 7 yards of cambric at 12c. a yard and had 9c. left. How much money had she?
17. There are 6 rows of 12 desks each and 4 side desks in a school-room. How many pupils can be seated?
18. Perry is 12 years old; Aaron is $\frac{5}{6}$ as old. What is the age of Aaron?
19. The fuel for the house costs \$60, and for the store $\frac{5}{12}$ of that amount. What is the cost of fuel for the store?



1. A butcher paid $6 each for 11 calves, and $4 for bringing them to his yard. How much did the calves cost him?
2. How many bags, each holding 2 bushels, are required to contain 22 bushels of wheat?
3. At 11c. a pound, how much meat can be bought for 77c.?
4. How many pecks in $\frac{1}{11}$ of 55 bushels? $\frac{1}{11}$ of 121 bushels?
5. A man had 11 $10 bills with which to pay a debt of $103. How much had he left after payment?
6. The distance around a square is equal to 3 times 12 inches. How many inches on one side of the square?
7. There are 24 sheets of paper in a quire. How many sheets in $\frac{1}{2}$ a quire? In three-halves?
8. If the price of 12 tons of coal is given, how do you find the price of one ton? Of 7 tons?

9. 48 equals how many 12's? 8's? 6's? 4's?
10. 72 equals how many 12's? 9's? 8's? 6's?
11. 38 equals how many 12's? 11's? 10's? 9's? 8's?
12. 60 equals how many 12's? 11's? 10's? 9's? 8's?
13. 42 equals how many 12's? 11's? 10's? 9's? 8's?
14. 62 equals how many 12's? 11's? 10's? 9's? 8's?

15. How many 12's in 90? In 100? In 120? In 140?
16. How many 11's in 90? In 110? In 115? In 80?
17. How many dimes in $1.20? In $1.80? In $2.50? In $5? In a $10 bill?

1. ( ) times ( ) are 6.
2. ( ) times ( ) are 8.
3. ( ) times ( ) are 9.
4. ( ) times ( ) are 10.
5. ( ) times ( ) are 12.
6. ( ) times ( ) are 14.
7. ( ) times ( ) are 15.
8. ( ) times ( ) are 16.
9. ( ) times ( ) are 18.
10. ( ) times ( ) are 20.
11. ( ) times ( ) are 21.
12. ( ) times ( ) are 22.
13. ( ) times ( ) are 24.
14. ( ) times ( ) are 25.
15. ( ) times ( ) are 27.
16. ( ) times ( ) are 28.
17. ( ) times ( ) are 30.
18. ( ) times ( ) are 32.
19. ( ) times ( ) are 33.
20. ( ) times ( ) are 35.
21. ( ) times ( ) are 36.
22. ( ) times ( ) are 40.
23. ( ) times ( ) are 42.
24. ( ) times ( ) are 44.
25. ( ) times ( ) are 45.
26. ( ) times ( ) are 48.
27. ( ) times ( ) are 49.
28. ( ) times ( ) are 50.
29. ( ) times ( ) are 54.
30. ( ) times ( ) are 55.
31. ( ) times ( ) are 56.
32. ( ) times ( ) are 60.
33. ( ) times ( ) are 63.
34. ( ) times ( ) are 64.
35. ( ) times ( ) are 66.
36. ( ) times ( ) are 70.
37. ( ) times ( ) are 72.
38. ( ) times ( ) are 77.
39. ( ) times ( ) are 80.
40. ( ) times ( ) are 81.
41. ( ) times ( ) are 84.
42. ( ) times ( ) are 88.
43. ( ) times ( ) are 90.
44. ( ) times ( ) are 96.
45. ( ) times ( ) are 99.
46. ( ) times ( ) are 100.
47. ( ) times ( ) are 108.
48. ( ) times ( ) are 110.
49. ( ) times ( ) are 120.
50. ( ) times ( ) are 121.
51. ( ) times ( ) are 132.
52. ( ) times ( ) are 144.

1. 12 equals how many 6's? 4's? 3's? 2's?
2. 16 equals how many 8's? 4's? 2's?
3. 18 equals how many 9's? 6's? 3's? 2's?
4. 20 equals how many 10's? 5's? 4's? 2's?
5. 36 equals how many 12's? 9's? 6's? 4's? 3's?

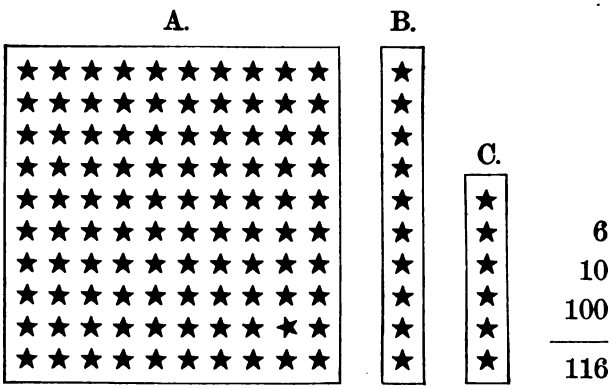
DRILL TABLE.

A.	*6's?*	*7's?*	*8's?*	*9's?*	*10's?*	*11's?*	*12's?*
1	6	14	40	9	50	11	110
3	48	28	24	36	40	44	96
2	24	7	16	18	20	99	48
5	36	21	32	27	90	55	24
7	12	35	56	45	10	77	72
4	30	56	48	36	80	66	36
6	42	49	8	90	100	88	12
10	54	63	80	108	70	33	144
12	66	84	96	54	120	110	120
9	18	70	64	63	30	22	84

Thoughtful practice secures both speed and accuracy.

1. ADD, at sight, column *A*. Add each number in column *A*, to 12. Add each of the digits to each number in the other columns. By columns, give the sum of each number and the one below it; after considerable practice each number and two below it may be taken.
2. SUBTRACT each number in *A* from each number in all other columns, passing by lines from left to right.
3. MULTIPLY each number in *A* by 2; by 3, 4, etc., to 12; then by 20, 30, etc., to 90.
4. Name the number of 6's in 2d column; 7's in 3d column, etc.
5. Name the number of 6's in 3d column, etc., reading only the quotients and remainders.

Other ways of naming results may be devised.



$100 + 10 + 6 = 116.$

NOTATION AND NUMERATION.

1. How many stars in column C? Column B? In column B and C? Write each number?
2. How many columns in group A? How many stars in each column? How many are 10 times 10? How many 10's in 100? How many *ones* or *units* in 10?
3. How do you write the sum of B and C? A and B? A, B and C?
4. What may be placed at the right of 6 to make a number ten times as large? One hundred times as large?
5. What is the effect of changing a figure from units' place to tens' place? What is the effect of moving a figure from tens' place to hundreds' place?
6. Write 3 in hundreds' place and 4 in units' place. In this case what do you write in tens' place to show that 3 is in hundreds' place?
7. 12 is 10 and 2 = one ten and 2 units.
8. 21 is 20 and 1 = two tens and one unit.
9. 99 is 90 and 9 = nine tens and nine units.

Periods, - - -	Millions.			Thousands.			Units.		
Orders, - - -	9th. Hundred-millions.	8th. Ten-millions.	7th. Millions.	6th. Hundred-thousands.	5th. Ten-thousands.	4th. Thousands.	3d. Hundreds.	2d. Tens.	1st. Units.
							4	0	5
						3	4	5	0
					4	6	0	2	3
				8	0	5	1	3	2
			2	4	0	5	4	0	0
		7	5,	0	6	0,	0	6	0
	6	4	5,	3	2	8,	7	8	3

The characters used in Arabic Notation are the figures 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. The first of these is called *zero*, *naught*, or *cipher*, and represents no value.

1. In writing large numbers *separate the periods of figures by a comma.*
2. 223 is 200, 20 and 3 = two hundreds, two tens, and 3 units.
3. 405 is four hundreds, no tens and five units. It is read four hundred, five.
4. 46,023 is four ten-thousands, six thousands, no hundreds, two tens and three units. It is read forty-six thousand, twenty-three.
5. 75,060,060 = seventy-five million, sixty thousand, sixty.

Write in columns the figures which express the following numbers:

1. Seventeen. One hundred seven.
2. Twenty-nine. Three hundred eighteen.
3. Fifty-two. Nine hundred thirty-eight.
4. Seventy-eight. Four thousand two hundred.
5. Forty-five. Nine thousand one hundred twelve.
6. Five thousand. Seven hundred thousand. Six million.
7. Five million. Five thousand. Five.
8. Seventy-two million. Nine hundred forty-five thousand. Eight hundred sixteen.
9. Sixty million. Sixty thousand. Six hundred.
10. Eighty million. Eighty thousand. Eighty.
11. Thirty-nine million. Eight thousand. Nine.
12. Fifty-six million. Three hundred twenty thousand. Nine hundred sixteen.
13. Seventy-five million. Twenty-eight thousand. Nine.
14. Two hundred forty-seven million. Six hundred twenty-five thousand. Eight hundred sixteen.

Write in words, read from the page, or write in figures from dictation:

15. 84	25. 52360	35. 23742635
16. 100	26. 73064	36. 46375904
17. 119	27. 80975	37. 57298027
18. 236	28. 93620	38. 69380324
19. 328	29. 100000	39. 72506241
20. 456	30. 123250	40. 83037256
21. 508	31. 267580	41. 90364562
22. 643	32. 329705	42. 100000000
23. 759	33. 463076	43. 123234345
24. 804	34. 520362	44. 231456213

1. Read the following:

   3, 5, 70, 100, 2,500, 5,000, 40,000, 200,000.

2. Place a cipher at the right of each number represented, then read.
3. Write two ciphers instead of one, then read.
4. What effect would a cipher have on 2 if placed at the right of 4 in 24? If the cipher were placed between the 2 and 4? If the cipher were placed before the 2?

U. S. MONEY.

One dollar may be written \$1, or \$1.00.

One dollar and fifty cents may be written \$1.50.

The point after the \$1 means that the two figures on the right of it stand for cents, and the figure or figures on the left of it stand for dollars. This point is called the *decimal point.* Mills are written to the right of cents. No point is placed between cents and mills.

Two dollars and twenty-five cents = \$2.25.

Ten dollars, sixty cents and four mills = \$10.604.

READ.

1. \$3.15.	3. \$12.85.	5. \$6.39.	7. \$84.667.
2. \$7.35.	4. \$13.40.	6. \$9.13.	8. \$95.875.

WRITE IN FIGURES.

9. Seven dollars and seventy-five cents.
10. Thirty dollars, ninety cents and one mill.
11. One hundred fifty dollars and eighteen cents.

When dollars and cents are written in figures in one sum, the cents occupy two places even when they are less than ten.

Four dollars and five cents = \$4.05.

READ.

12. \$5.01.	14. \$9.03.	16. \$25.09.	18. \$17.07.
13. \$8.02.	15. \$3.04.	17. \$30.06.	19. \$80.08.

WRITE IN FIGURES.

20. Seventeen dollars and seven cents.
21. Seventy-one dollars and seventy cents.
22. One hundred dollars and nine cents.
23. Eighty dollars, eighty cents and eight mills.
24. Fifty dollars, fifty cents and five mills.
25. Fifty dollars, five cents and two mills.

ADDITION.

A. B. C.

1. How many stars in group A? In group B? In group C?
2. How many stars in groups A and B put together?
3. How many stars in groups A, B and C put together?
4. How many are 4, 5 and 6?
5. Are 15 cents as many cents as 4 cents, 5 cents and 6 cents?
6. $4 + 5 + 6 = 15$. 15 is called the *sum* of 4, 5 and 6.
7. Find the sum of 8 and 4 and 2.
8. What is the sum of 9 and 7 and 4?
9. 5 books + 7 books = how many books? 4 books + 9 books = what?
10. 21 hats + 8 hats = how many hats? 5 hats + 10 hats?
11. 17 eggs + 6 eggs = how many eggs? 11 + 9 eggs?
12. 34 cows + 10 cows = how many cows? 6 cows + 14 cows?
13. 41 hens + 13 hens = how many hens? 5 hens + 7 hens?
14. 27 desks + 12 desks = how many desks? 10 desks + 11 desks = what?
15. 24 pencils + 7 pencils = how many pencils? 9 pencils + 100 pencils = what?
16. 30 windows + 15 windows = how many windows? 15 windows + 20 windows = what?
17. 53 slates + 5 slates = how many slates? 9 slates + 20 slates = what?
18. 75 papers + 100 papers = how many papers? 25 papers + 35 papers = what?
19. 50 cents + 50 cents = how many cents? 25 cents + 10 cents = what?

1.	2.	3.	4.	5.
$1.55	$45.76	$9.30	$75.45	$85.95
.08	3.72	12.10	25.71	57.38
4.50	21.31	17.68	20.04	19.99
83.69	7.75	88.33	68.37	6.43
15.65	32.87	9.77	.25	37.75

FIND REMAINDERS.

6.	7.	8.	9.
$56.29	$54.54	$13.74	$99.99
5.25	24.54	7.53	90.90

10.	11.	12.	13.
$10.34	$45.32	$77.55	$321.76
7.25	22.50	65.95	140.35

FIND PRODUCTS.

14.	15.	16.	17
$2.63	$16.24	$37.58	$56.17
2	3	4	5

1. A boy paid 25c. for a First Reader, and 10c. for a slate. How much did he pay for both?
2. A girl paid 30c. for a Second Reader, 12c. for a writing-book, and 8c. for a sponge. How much did she pay for all?
3. 20c. was paid for a drawing-book, 15c. for a speller, and 9c. for a pencil. How much was paid for all?
4. John has 18 marbles, James 12 marbles, and George 9 marbles. How many marbles have they all?
5. Mary had 32c., her father gave her 11c., and her mother 8c. more. How many did she then have?
6. How many bushels of apples will three men pick in one day, if the first pick 16 bushels, the second 12 bushels, and the third 11 bushels?
7. Minnie, Emma, and Jane went out berrying; Minnie gathered 21 pints, Emma 15 pints, and Jane 12 pints. How many pints did they all gather?
8. A gentleman has 12 books on one table, 10 on another, 9 on a third table, and 8 on the fourth. How many has he on the four tables?
9. A man sold 10 turkeys to one man, 9 to another, 8 to a third, and kept 7. How many turkeys had he at first?
10. A gentleman kept 15 sheep in one field, 9 in another, 8 in a third, and 7 in a fourth. How many sheep did he have?
11. A woman paid $12 for a shawl, $10 for a bonnet, $8 for a chain, and $6 for a pair of shoes. How much money did she expend?
12. A gentleman bought a sleigh for $45, a set of harness for $15, a robe for $7, and a whip for $5. How much did he pay for all?

1. Add 9 thousand 3, 58 thousand 68, 64 thousand 208, 99 thousand 99, 273 thousand 574, 540 thousand 730, 879 thousand 7, 386.
2. Add 12 thousand 29, 79 thousand 524, 357 thousand 58, 792 thousand 218, 854 thousand 679, 927 thousand 9, 678 thousand 75, 2368.
3. Add 239 thousand 316, 528 thousand 97, 2 million 365 thousand 297, 7 million 67 thousand 954, 9 million 95 thousand 658, 8 million 586 thousand, 9 million 209.
4. Add 538 thousand 297, 3 million 3, 5 million 5 thousand 555, 6 million 72346, 9 million 75 thousand 654, 10 million 10 thousand 10, 2 million 807307.
5. Add 5 million 467 thousand 956, 729 thousand 475, 3 million 250 thousand 563, 7 million 368 thousand 845, 1729, 12 thousand 699, 4 million 37 thousand 76, 3 million 754 thousand 684, 9 million 500.

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6. Add 43 thousand 687, 56 thousand 437, 64 thousand 482, 75 thousand 438, 79 thousand 347, 86 thousand 596.
7. Add 6 million 827 thousand 973, 2 million 638, 829 thousand 976, 5 million 38 thousand 647, 798 thousand 364, 4 million 7, 7 thousand 8, 7 million 984 thousand 879, 9 million 99 thousand 99.
8. Add 3 thousand 709, 53 thousand 678, 4 million 579 thousand 863, 7 million 620 thousand 308, 495 thousand 678, 7 million 875 thousand 689, 29,844.
9. Add 47854, 328 thousand 567, 2 million 47 thousand 854, 579 thousand 863, 4 million 876 thousand 594, 3 million 2 thousand 8, 97 thousand 582, 9010987.
10. Add 87 million 964 thousand 757, 3 million 986 thousand 759, 975 thousand 368, 77 thousand 675, 7 thousand 854, 989, 78, 9, 123674, 8478.

DRILL EXERCISES.

At sight, name the sums:

1.	5	6	7	8	9	4	8	7	7	5
	4	7	8	9	3	9	6	7	9	9
2.	5	6	9	8	7	6	5	7	4	3
	3	7	5	6	8	9	4	6	9	9
	2	3	4	5	6	5	6	9	8	7
3.	10	41	22	53	84	75	36	67	98	59
	6	6	6	6	6	6	6	6	6	6
4.	90	73	82	38	64	77	51	45	26	19
	7	7	7	7	7	7	7	7	7	7
5.	39	63	94	25	86	17	72	51	48	55
	8	8	8	8	8	8	8	8	8	8
6.	33	66	87	55	22	99	11	44	77	90
	9	9	9	9	9	9	9	9	9	9

March 15, 1887.

Mr. Henry Smiles

Bought of James Duncan,

1 span of Norman horses	*$486*
1 Norman colt	*115*
1 Jersey cow	*235*

1. Paid $367 for a horse, $2,698 for a house, and $479 for furniture. How much did I pay for all?
2. A lot cost me $3,964, a barn $996, fencing $1,387, and sidewalk $178. What did they all cost?
3. A ship sailed in one week 846 miles, the second week 958 miles, and the third week as much as the other two. How far did she sail in the three weeks?
4. Three vessels are loaded with lumber, as follows: the first carries 29,368 feet, the second 31,986 feet, the third 37,568 feet. How many feet do they all carry?
5. Bought 4 car loads of wheat, paying for the first $878.36, for the second $ 179.75, for third $1,288.08, and for the fourth $1,587.12. How much did I pay for the wheat?

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6. Built a block of four houses; the two end ones cost me $4,897.60 each, and the two middle ones $3,579.87 each. What did the block cost me?
7. A and B each paid $29,768.30 taxes, and C and D each $18,679.79. How much did they all pay?
8. The water tax receipts during the first week of February, 1875, were $9,367.50, the second week $8,576.86, the third week $11,975, and the fourth week $9,987.87. What were the receipts for February?
9. Bought a house for $5,897.48, a lot for $3,673.62, and sold them both so as to gain $1,976.50. How much did I receive for them?
10. There are 5,760 grains in one pound of silver. How many grains are there in 6 pounds of silver?
11. I bought a house for $3,578, and repaired it at a cost of $894.75. I wish to sell it so as to gain $750. For how much must I sell it?

1. I saw 36 birds in one flock, 14 in another, 12 in a third, and 8 in a fourth. How many birds did I see?
2. A lady put up 30 quarts of cherries, 20 quarts of plums, 15 quarts of peaches, and 9 quarts of tomatoes. How many quarts of fruit did she put up?
3. A man went on a journey of four days; the first day he traveled 28 miles, the second 12 miles, the third 15 miles, and the fourth 9 miles. How far did he travel?
4. Bought 20 yards of muslin from one merchant, 20 yards from another, and 30 yards from a third. How many yards did I buy?
5. Gave $9 for a pair of boots, $8 for a coat, and 90c. for a pair of gloves. How much did they all cost?
6. A boy wrote 20 words in one minute, 16 the second, 10 the third, 8 the fourth, and 6 the fifth. How many words did he write in five minutes?
7. Gave $5 for a hat, 50c. for a neck-tie, $4 for a vest, and 40c. for a pair of cuffs. How much was given for all?
8. James earned $8, and William $7 in one week, and their father as much as both. How much did they all earn?
9. Paid 20c. for 12 oranges, and 30c. for 15 oranges. How much money did I expend? How many oranges did I buy?
10. Paid 50c. for 13 lemons, and 40c. for 9 lemons. How many lemons did I buy? How much did they cost?
11. John worked 7 days for $4, and James 8 days for $7, and Rufus as many days as John and James for $11. How many days did they all work? How much did they receive?
12. Sold a chain for $11, a watch for $20, and a cow for as much as both watch and chain. How much did I get for all?

1. The cash sales of a certain merchant were as follows: Monday, $231.14; Tuesday, $252.36; Wednesday, $342.71; Thursday, $623.48; Friday, $432.27; Saturday, $536.58. What is the sum of the cash receipts?
2. Bought a lot for $1,876, and built a house on it that cost me for carpenter work, $2,345.67; mason work, $365.70; painting, $231.50; for leveling the lawn and making sidewalk, $371.25. What did the whole cost?
3. A man drew out of a bank $3,154.76, and had left in the bank $5,193.73. Find the number of dollars he had in the bank at first.
4. Having $1,284, I sold a house for $5,489 cash and a note for $2,713.54. How much money did I then have?
5. I have $7,540; how much will I have after laying up $345 each month for four months?

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6. My salary is $2,500 a year, and I receive $1,780 for two houses which I rent, and $673.92 interest on money loaned. What is my income?
7. A farmer sold a horse for $175, two cows for $76.85, a tub of butter for $23.46, and a load of hay for $13.75. How much did he receive for all?
8. A merchant has $4,765.31 in the bank; how much will he have in the bank after he deposits in the bank $797.37 in cash and $564.11 in checks?
9. I paid $2,243 for a house, $825 for a barn, and for a farm as much as for the house and barn. How much did I pay for all?
10. Spent $205.75 Monday, $198.20 Tuesday, $197.50 Wednesday, $156.87 Thursday, $402 Friday, and $375.50 Saturday. How much did I spend during the week?

Add the following rapidly, by lines and by columns. Make combinations of 10 as often as possible; thus $6+4+7+3=10+10=20$.

	1.	*2.*	*3.*	*4.*	*5.*	*6.*	*7.*	*8.*	*9.*	*10.*	*11.*
12.	6	+ 5	+ 4	7	+ 6	+ 5	+ 4	8	+ 7	+ 6	+ 5
13.	5	+ 7	+ 5	9	+ 3	+ 2	+ 6	1	+ 7	+ 8	+ 4
14.	4	+ 9	+ 3	4	+ 7	+ 6	+ 3	9	+ 5	+ 9	+ 5
15.	6	+ 2	+ 8	6	+ 5	+ 8	+ 5	7	+ 4	+ 6	+ 5

	16.	*17.*	*18.*	*19.*	*20.*	*21.*	*22.*	*23.*	*24.*
25.	50	+ 80	+ 30	10	+ 90	+ 50	20	+ 40	+ 60
26.	70	+ 40	+ 70	50	+ 80	+ 30	90	+ 50	+ 30
27.	60	+ 10	+ 90	70	+ 60	+ 20	10	+ 70	+ 80

	28.	*29.*	*30.*	*31.*	*32.*	*33.*	*34.*	*35.*
36.	3000	+ 700	+ 60	+ 2	2000	+ 400	+ 60	+ 8
37.	5000	+ 200	+ 40	+ 7	9000	+ 800	+ 50	+ 4
38.	6000	+ 800	+ 70	+ 9	4000	+ 500	+ 70	+ 7
39.	4000	+ 300	+ 30	+ 2	3000	+ 200	+ 40	+ 6

40.	*41.*	*42.*	*43.*	*44.*
$ .50	$2.50	$10.25	$50.25	$125
.50	2.50	10.25	50.25	125
.50	2.50	10.25	50.25	125

45.	*46.*	*47.*	*48.*
$200.75	$305.40	$525.60	$1010.50
200.25	80.60	60.40	900.00
44.00	2.50	.50	89.50

	1.	2.	3.	4.	5.	6.
7.	$ 5.607	$36.089	$59.006	$68.02	$ 85.308	$165.00
8.	7.81	45.004	67.507	74.326	97.009	276.06
9.	12.563	38.25	59.06	86.005	128.03	359.007
10.	27.00	.978	.052	3.00	.57	998.999
11.	139.875	48.764	57.372	49.078	584.27	875.00
12.	237.00	9.006	8.987	.06	263.00	896.08

13. Find the sum of $327.34, $648.19, $57.68 and $1.05.
14. Find the sum of 12634 feet, 2542 feet and 10063 feet.
15. Find the sum of 576 bushels, 971 bushels and 38 bushels.
16. Find the sum of 1147 days, 984 days and 1321 days.
17. Find the sum of 154684 yards, 7673 yards and 48 yards.
18. Find the sum of 31076 rails, 2950 rails and 9875 rails.
19. Find the sum of 75000 lbs., 108504 lbs. and 706250 lbs.
20. Find the sum of $785.50, $581.01, $179.88 and $450.
21. Find the sum of $975.25, $1000.47, $48.85 and $750.
22. Find the sum of $8.95, $205.05, $8075, and $25250.

ATTENDANCE AT PUBLIC SCHOOL.

	23.	24.	25.	26.	33.
WARD.	1st qr.	2d qr.	3d qr.	4th qr.	TOTALS.
27. First, - - -	79276	62183	71993	68264	.....
28. Second, - - -	76381	85643	93300	77211	....
29. Third, - - -	34720	37523	27851	25437	.....
30. Fourth, - - -	8427	8465	8192	7989	.....
31. Fifth, - - -	11698	12325	12765	11361	.....
32. Sixth, - - -	3625	4283	3973	3264	.....
34. TOTALS, - -	.....	.....	.....	....	....

1. Paid $3 for 20 quarts of berries, $2 for 15 quarts, and 60c. for 5 quarts. How many quarts of berries did I buy? How much did they cost?
2. Gave 30c. for 2 pounds of beef, 40c. for 3 pounds of pork, 20c. for 2 pounds of mutton. How many pounds of meat did I buy? How much did I pay for meat?
3. A man bought a sleigh for $20, a harness for $15, and sold them at a gain of $9. How much did he receive?
4. A cage was made of 12 wires on each side, 8 on each end, and 30 in the roof. How many wires were required to make the cage?
5. How many strokes does a clock, that strikes the hours, make in 12 hours?
6. A room is 20 feet long, and 15 wide. How many feet long is a line drawn entirely around the room?
7. A gentleman upon a journey traveled 25 miles a day for 5 days, and 35 miles on the sixth day; how far did he travel during his journey?
8. Paid $12 for books, $18 for clothes, and as much for a horse as for both, plus $10. How much money did I expend?
9. A person walked 20 miles from home in one day, and the second day 30 miles farther; the third day he rode the entire distance home again. How far did he travel during the three days?
10. Two houses are 6 miles apart. How far will that person travel who starts from one of them, visits the other, and returns?
11. In an orchard there are 12 cherry trees, 16 pear trees, and four more apple trees than pear trees. How many trees are there in the orchard?

REVIEW—WRITTEN.

1. A farmer, a certain year, raised one thousand 175 bushels of wheat, twice as many bushels of oats, and nine hundred eight bushels of corn. How many bushels of grain did he produce?
2. In one army there were 60 thousand five hundred men, in another 19050 and in a third as much as in these two. How many men in the three armies?
3. Bought a house for $4688, a lot for $3650; I sold the house at a gain of $627, and the lot at a gain of $565. How much did I receive for both?
4. Four drovers sent sheep to market, the first sending 976, the second 1079, the third 1285, and the fourth as many as the first and second. How many did they all send?
5. Add $875.50, $123.08, $59.21, $785.25 and $975.
6. A, B, C and D, are farmers; A made in one year $1365, B made $3760, C made $2560, and D made $1468. How much did they all make?
7. A real estate dealer sold 2 lots for $2976.40 each, and 2 others for $2745.80 each. How much did he receive for them all?
8. Bought 256 bushels of wheat for $378.75, 267 bushels of oats for $198.68, 176 bushels of corn for $119.96, and 398 bushels of hay seed for $1367.75. How much did they all cost? How many bushels were bought?
9. Paid $3560 for a house, and $1880 for a lot. How much must I pay for 3 such houses, and 2 such lots?
10. One section of land has four equal sides, each one mile (5280 feet) long. How many feet around a section?

SLATE OR BLACKBOARD DRILL.

	23.	*24.*	*25.*	*26.*	*27.*	*28.*
1.	567	4689	75467	543876	7983648	6785468
2.	453	7568	54874	756836	5867437	7584786
3.	978	5674	43677	647479	4976877	7376854
4.	867	6756	89763	876543	7387586	9367973
5.	946	7568	54576	786436	8975438	7546856
6.	587	8746	87658	475679	5467679	7678457
7.	764	5978	48326	787536	4857748	4856738
	29.	*30.*	*31.*	*32.*	*33.*	*34.*
8.	648	8364	75898	569478	8485675	7948557
9.	873	5799	89784	678797	5676487	8769858
10.	764	8658	76348	956746	7834656	7989998
11.	953	6784	57867	758667	5847589	8888888
12.	564	7579	76845	876748	8795664	7675757
13.	756	6874	54597	456685	7547878	9695609
14.	965	7549	68745	874896	8567557	7685785
15.	547	6793	85697	568437	5784995	8659897
	35.	*36.*	*37.*	*38.*	*39.*	*40.*
16.	976	5547	58746	875968	8659448	5784546
17.	752	8796	76568	968475	7586878	8638757
18.	587	6547	67875	697989	8979789	7987899
19.	678	9876	58362	823424	9106758	8956785
20.	756	7837	95764	756848	7647576	8678598
21.	547	8768	69897	863685	5638975	6738967
22.	679	6578	75645	697876	8756787	9763687

NOTE.—For examples 1 to 22, inclusive, read across the page.

SUBTRACTION.

1. How many stars in this group?
2. If you take away 4 of the stars, how many will remain?
3. There are 9 boys in a room, 5 of them go out. How many are left?
4. On a table are 15 books, 7 of them are taken away. How many remain?
5. A boy has 35 cents, if he should lose 12 cents, how many would he have?

SUBTRACTION is the process of taking part of a number away to find what remains.

6. 18 is how many greater than 15?
7. Jane has 25c. and Lucy has 12c. How many more cents has Jane than Lucy?
8. One tree in my garden is 38 feet high, another is 20 feet high. How much higher is the one than the other?

SUBTRACTION is, also, the process of finding the difference of two numbers.

The numbers used in subtraction are called Minuend, Subtrahend, and Remainder or Difference.

9. From 35 subtract 12.

$$\begin{array}{r} 35 = \text{Minuend.} \\ 12 = \text{Subtrahend.} \\ \hline 23 = \text{Remainder.} \end{array}$$

PROOF: *Subtrahend + Remainder = Minuend: 12+23=35.*

Of what two numbers is the minuend the sum?

1. The minuend is 50 and the subtrahend is 35. What is the remainder?
2. The subtrahend is 17 and the remainder is 33. Find the minuend.
3. 51 gallons is the minuend and 26 gallons is the remainder. What is the subtrahend?

DRILL EXERCISES.

From each of the following subtract 6, then 7, then 8, then 9. Name results only.

	a.	*b.*	*c.*	*d.*	*e.*	*f.*	*g.*	*h.*	*i.*	*j.*
1.	11	17	13	12	18	14	19	15	20	16
2.	25	22	28	23	21	24	29	27	26	30
3.	31	35	39	32	36	40	33	37	34	38
4.	44	47	41	45	48	42	46	49	43	50
5.	52	55	57	53	56	58	51	54	59	60
6.	69	67	65	63	70	68	66	64	62	61
7.	78	76	74	72	75	71	73	77	79	80
8.	90	85	81	84	88	86	83	87	82	89
9.	91	97	92	98	93	94	96	95	99	100

10. What is the difference of 28 and 7?
11. 56 tops and 12 tops?
12. $85 and $60?
13. 37c. and 15c.?
14. 9 times 7, and 6?
15. 94 rods and 54 rods?
16. 70 days and 11 days?
17. 81 tons and 72 tons?
18. 64 pens and 54 pens?

19. What is the remainder, after taking 47 out of 57?
20. 47 from 53?
21. 16 pk. from 35 pk.?
22. 7c. from 65c.?
23. $81 from 8 times $12?
24. 18 years from 50 years?
25. 15 min. from $\frac{3}{4}$ of an hour?
26. 4 qt. from 4 pk.?
27. 5 days from 1 week?

COPY AND SUBTRACT.

1.	*2.*	*3.*	*4.*	*5.*	*6.*
2475	3146	4823	5369	6577	8981
1903	2015	2510	3257	3456	7350

7.	*8.*	*9.*	*10.*	*11.*	*12.*
4699	5030	6644	7322	8549	9999
4300	2010	6640	7020	8009	9099

13. From 243 subtract 125.

$243 = 200 + 30 + 13$
$125 = 100 + 20 + 5$
$118 = 100 + 10 + 8$

Five units can not be taken from 3 units. Take one of the tens and add it to the 3 *u.*, making 13 units. Now subtract 5 units from 13 units, 2 tens from 3 tens, and 1 hundred from 2 hundreds.

14.	*15.*	*16.*	*17.*	*18.*	*19.*	*20.*
253	465	572	785	895	498	981
135	247	327	438	577	169	749

21. What number must be added to 257 to make 3782?
22. If I buy a horse for \$145 and sell it for \$180, do I gain or lose? How much?
23. The art of printing was invented in 1444. How many years since then?
24. The minuend is 49 more than the subtrahend, which is 546; what is the minuend?
25. The subtrahend is 125 less than the minuend, which is 750; what is the subtrahend?
26. The difference of two numbers is 84. The larger number is 590; what is the less number?

1. Paid 14c. for paper, and 9c. for a pencil? How much more was paid for the paper than for the pencil?
2. Mary is 16 years old, and her brother is 8 years old. What is the difference of their ages?
3. John bought 18 marbles, and James 12. How many more did John buy than James?
4. A lady having $19, paid $8 for a shawl. How much did she have left?
5. A boy gathered 21 quarts of nuts, and sold 12 quarts. How many quarts were left?
6. A man bought 28c. worth of meat, and gave the trader 35c. How much change should he receive?
7. Bought 38c. worth of cotton cloth, and gave the merchant 50c. How much change should I receive?
8. Bought a suit of clothes for $36, and gave the dealer $50. How much change should I receive?
9. A gentleman is 60 years old, and his wife is 12 years younger. How old is the wife?
10. A farmer raised 75 bushels of corn this year, which is 15 bushels more than he raised last year. How much did he raise last year?
11. Paid $90 for a wagon, and sold it at a loss of $20. How much did I receive for the wagon?
12. Took 80 bushels of oats to market, which is 30 bushels more than I left at home. How many bushels did I leave at home?
13. Sold 100 bushels of wheat, which was 30 bushels more than I kept. How many bushels did I keep?
14. Bought 88c. worth of groceries, and gave the grocer $1. How much change should I receive?
15. I sold a slate for 75c., which was 12c. less than it cost. What was the cost?

1. From 322 subtract 148.

$$322 = 200 + 110 + 12$$
$$148 = 100 + 40 + 8$$
$$174 = 100 + 70 + 4$$

2.	*3.*	*4.*	*5.*	*6.*	*7.*
531	453	645	754	876	956
275	166	368	685	498	789

8.	*9.*	*10.*	*11.*	*12.*	*13.*
768	482	544	675	735	943
379	184	288	387	467	758

14.	*15.*	*16.*	*17.*	*18.*
2745	3476	4563	5784	8945
1338	1267	2356	2577	5438
1407				

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19. From 500 subtract 235.

$$500 = 400 + 90 + 10$$
$$235 = 200 + 30 + 5$$
$$265 = 200 + 60 + 5$$

20.	*21.*	*22.*	*23.*	*24.*
4500	5600	7800	8750	9643
2860	2750	4945	3875	5385
1640				

25.	*26.*	*27.*	*28.*	*29.*
4308	7403	8705	9609	7604
2009	3005	5206	4290	4888
2299				

30.	*31.*	*32.*	*33.*	*34.*
6080	9987	8794	9000	7777
4391	3988	2895	999	5778

1. Paid 7c. for a pencil, 12c. for a book, and gave 25c. to the dealer. How much change should I receive?
2. A lady had $12, found $10, and afterward lost $8. How much did she have left?
3. Had 50c., paid 30c. for a book, and 12c. for toys. How much had I left?
4. A farmer kept 45 hogs in 3 pens; in one pen were 20 hogs, in the second 15. How many were there in the third?
5. Mary had 12 peaches, Jane 9 peaches, and Sarah 30 peaches. How many peaches has Sarah more than both Mary and Jane?
6. A wagon cost $50, a sleigh $20, and harness $10. How much does the wagon cost more than both sleigh and harness?
7. Buy 40c. worth of sugar, and 30c. worth of coffee. How much change should I receive if I give the grocer $1?
8. A hogshead will hold 63 gallons. If I pour into it at one time 40 gallons, at another 14 gallons, how many gallons more will fill it?
9. A boy put 18 chickens into one coop, 12 into another, and enough in the third to make 45 altogether. How many did he put into the third coop?
10. A woman paid 50c. for some tea, 25c. for cheese, and enough for oil to make her bill $1. How much did she pay for oil?
11. A farmer planted an orchard of 100 apple trees in 4 days. The first day he planted 30 trees, the second 30 trees, the third 20 trees. How many did he plant the fourth day?
12. A gentleman receives a salary of $72 a month, and his son a salary of $60 a month. How much more does the father receive than the son in 9 months?

1. The subtrahend is $9457; the difference is $7638. What is the minuend?
2. The difference is 12758 feet; the subtrahend 25697 feet. What is the minuend?
3. A gentleman's income one year was $2958, and the next year it was $4120. How much greater was his income the second year than the first?
4. Two vessels start from the same point and travel in the same direction; the one 7821 miles, the other 5078 miles. How far apart are they?
5. A gentleman owns two vessels, one of which will carry 25763 feet of lumber, and the other 20976 feet. How much will the first vessel carry more than the second?

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6. In the Chicago Water Works one of the engines will pump 38,000,000 gallons per day, another 18,675,450 gallons. How many gallons more does the larger engine pump than the smaller, per day?
7. Gave $15234 for a farm, and spent $8796 less for erecting buildings upon it. How much did the buildings cost?
8. A gentleman having $5538, expended $1689 for cattle. How much had he left?
9. A man having an estate worth $7834, bequeathed to his two sons $4975. How much did he retain?
10. A man bought a quantity of land for $12975, and sold it for $15250. How much did he gain?
11. The minuend is 8469; the subtrahend is 7883. What is the difference?
12. The difference of $17846 and $27984, is what was paid for a certain property; it was soon after sold for $14025. How much was the gain?

1. Having $2847, I sold a house for $5489; how much more do I need so that I shall have $23425?
2. A man worth $15300, gave $4360 to each of his two sons, and $4225 to his daughter, and the remainder to charitable purposes. How much did he give in charity?
3. Having $5895, I lost in trade $2750, then made $3560, afterward lost $4680, and then made $3690. How much did I have then?
4. From 300 thousand subtract the difference of ten thousand seventy and one hundred four.
5. Vice-President Wilson died in 1875 at the age of 63. The Declaration of Independence was made in 1776. How many years before the birth of Henry Wilson was Independence declared?

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6. A gentleman owning 589 acres of land, bought 349 more; he afterward sold at one time 294 acres, and at another 57 acres. How many acres were left?
7. If I travel Monday 275 miles from home, Tuesday 190 miles towards home, Wednesday 387 miles from home, and Thursday return 200 miles; how far from home am I Thursday night?
8. A brickmaker had 2 kilns, each containing 43567 bricks; he sold 8376 to his neighbor, Mr. Jones, and used 12564. How many bricks had he left?
9. From a bin containing 8007 bushels of salt, a merchant sold to one man 1020 bushels, to another 129 bushels, and to another the remainder. How many bushels did the last man buy?
10. A farmer, being asked how many sheep he had, said that if he had 420 + 560 more, he would have 3628. How many had he?

1. The source of the Missouri River is 6800 feet above the level of the sea; that of the Mississippi is 1680 feet above the sea level. How far above the source of the Mississippi is the source of the Missouri?
2. 3 houses are found to be standing in a straight line; the second 5420 teet from the first, and the third 7337 feet from the second. How far is the first house from the third house?
3. $6385 was paid for each of four houses, which were soon after sold so as to lose $987 on each of two of them. How much was received for the houses?
4. A commission merchant received 7598 barrels of flour for each of 3 months, and sold 7438 for each of 2 months. How many barrels has he left?

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5. If I can save $568 a year from my income, how much less than $3000 can I save in 4 years?
6. George Washington died in 1799 at the age of 67 years. How long before his birth was the discovery of America in 1492?
7. If a man's income is $200 a month, and his expenses are $35 a month for rent, $48.60 for grocery bills, and $45.75 for other expenses, how much can he save in 1 month? In 6 months?
8. An army of 100,000 men engaged in battle, and was re-enforced by 29000 more; 237 deserted, 12888 were killed, 15 '0 were missing. How many were left in the army?
9. Two lots cost $3768 each, and the houses that stand on them cost $4500 each. How much more did the houses cost than the lots?

PROBLEMS TO SHOW HOW CHANGE IS COMMONLY MADE.

Having 1c., 5c., 10c., 25c., 50c, pieces, and $1, $2 and $5 bills, count out the proper change in each of the transactions given below:

1. I have $1; buy a pencil for 8c.; a slate for 25c.

   REMARK: *Suppose the clerk to use two 1c., one 5c., one 10c. and one 50c., pieces, and, since the purchase is 33c., he will say, while putting the money into your hand, 35, 40, 50, $1.*

2. Have 50c.; buy a book, 35c.
3. Have 75c.; buy a coal-scuttle, 65c.
4. Have $1; buy a reader, 55c.; paper, 10c.; eraser, 3c.
5. Have $2; buy Burns' Poems, $1.25; St. Nicholas for June, 35c.
6. Have $2.50; pay one year's subscription to Youth's Companion, $1.75; buy stationery, 35c.
7. Have $3; buy a pair of shoes, $2.50; bananas, 15c.
8. Have $4; buy a cap, 75c.; scarf, 60c.; gloves, $1.
9. Have $5; buy sugar, $1.50; butter, 40c.; meat, 35c.
10. Have $7; buy a pair of boots, $5.25; slippers, $1.
11. Have $10; buy dress goods, $4.20; cambric, 38c.
12. Have $10; buy cheese, 70c., eggs, 60c.; tapioca, 40c.; butter, 80c.
13. Have $10; buy potatoes, $1.30; turnips, 50c.; tomatoes, 42c.
14. Have $10; buy a bbl. of flour, $5.60; corn meal, 48c.
15. Have $10; buy cashmere, $5.80; flannel, $1.75.
16. Have $15: buy a ton of coal, $6.25; cord of wood, $6.50.
17. Have $15; buy beef, $7.40; veal, $2.60: ham, $1.27.
18. Have $20; buy 4 bbl. of apples ($3.20 each), $12.80.
19. Have $20; buy a suit of clothes, $18.75.

A PRACTICAL METHOD.

1. A man having \$2719 paid \$628 for a lot and \$399 for a span of horses and harness.

REMARK: *Instead of adding the parts of the subtrahend, and then subtracting the sum from the minuend, the columns of the subtrahend are added, and as many to it as are required to make the unit figure of the sum equal to the corresponding figure in the minuend. Thus, 9 + 8 = 17. 17 and how many are 19? Write 2 in remainder and add 1 (ten) to next column. 1 + 9 + 2 = 12. 12 + (?) = 21? Write 9 in remainder and add 2 to the next column. 2 + 3 + 6 = 11. 11 + (?) = 17? Write 6 in remainder and add 1 to the next column. 1 + (?) = 2? Write 1 in remainder.* (*See page 81.*)

\$2719, Min.
628, } Sub.
399, }
\$1692, Rem.

	2.	3.	4.	5.
Min.	\$3864	\$5246.75	\$7566.48	9783 ft.
Sub.	823	1246.23	3270.16	3542 ft.
	724	873.16	2586.92	4624 ft.
Rem.				

	6.	7.	8.	9.
Min.	\$3256.40	43275 lbs.	5762 yds.	\$8765.00
Sub.	1024.35	12043 lbs.	1247 yds.	3246.38
	768.87	10037 lbs.	876 yds.	842.53
	105.05	8702 lbs.	1043 yds.	357.24
	38.21	4087 lbs.	1547 yds.	471.01

10. The sum of three numbers is 3825. One of the numbers is 1243, and another is 791. What is the third?

11. Mr. Howard deposited \$4350 in a bank. He drew out of the bank \$175.50, \$89.45, \$27.85, \$198.25, \$760.06, \$401.31, \$9.09, and \$2066.33. How much money had he left in the bank?

REVIEW—WRITTEN.

1. A person had one hundred ninety thousand dollars; he gave $50500 to found a school. How much had he left? Did you find the difference or remainder in this example?
2. Make an example in subtraction, using the numbers 3847 and 1999, such that your answer will be the difference of those two numbers.
3. The four quarters of a beef weighed 721 pounds, the hind quarters weighed 326 pounds, and one of the front quarters 169 pounds. What was the weight of the other quarter?
4. Make and solve an example in subtraction and show how to prove the answer correct.

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5. Mr. Lamb owns land valued at $3875, houses valued at $7800, and $745.85 in a bank. He owes $1550 on the land. How much will he have left; if he pays what he owes?
6. The minuend is 271635 and the remainder is 99777 less than 300000. What is the subtrahend?
7. A man possesses $100000; he owes $3478. After paying his debts, how much more will he have left than he owed?
8. From the largest number that can be written with the figures 3, 9, 7, 5, 8 and 4, subtract the smallest that can be written with the same figures.
9. F's salary is $2500 per annum. His personal expenses are $698; household expenses, $1239.50; insurance, $53.375; taxes, $115.40. What does he save in one year?

MULTIPLICATION.

1. How many rows of stars in this group?
2. How many stars in each row?
3. How many stars in the group?

REMARK.—*By addition: 6 stars + 6 stars + 6 stars + 6 stars = 24 stars.*

By multiplication: 4 times 6 stars = 24 stars.

4. 4 times 6 stars equal 24 stars.

In this example 6 (stars) is the *multiplicand.*

4 is the *multiplier.*

24 (stars) is the *product.*

The multiplicand and multiplier are *factors* (makers) of the product.

6 × 4 is read 6 multiplied by 4, or 4 times 6.

READ THE PRODUCTS.

5.

9 × 8?	6 × 12?	9 × 9?	12 × 7?
6 × 9?	12 × 8?	12 × 11?	11 × 11?
7 × 12?	10 × 12?	11 × 7?	12 × 12?
5 × 9?	9 × 7?	6 × 11?	7 × 6?
8 × 8?	9 × 9?	7 × 7?	6 × 6?
6 × 8?	11 × 9?	12 × 9?	10 × 11?
5 × 4?	7 × 8?	8 × 5?	4 × 12?
7 × 3?	9 × 2?	12 × 3?	12 × 5?

6. At $7 a ton what will 4 tons of coal cost?
7. What will be the cost of 6 oranges, if one orange costs 5c.?
8. Find the cost of 6 sheep at $4 apiece.

1. If one ton of coal costs $7, how much will 5 tons cost?
2. There are 8 quarts in one peck. How many quarts are there in 4 pecks?
3. How many pecks are there in 9 bushels, if there are 4 pecks in 1 bushel?
4. How much can a man earn in 6 days, if he can earn $8 in one day?
5. A gentleman gave $12 to each of his 5 sons. How much did all receive?
6. A person traveled 12 miles a day for 7 days. What distance did he travel?
7. A boy can earn $9 a month. How much can he earn in 9 months?
8. There are 12 inches in one foot. How many inches in a pole 8 feet long?
9. There are 3 feet in one yard. How many feet are there in 20 yards?
10. How many inches are there in 2 yards?
11. There are two pints in one quart. How many pints are there in 5 gallons.
12. Bought 12 yards of broadcloth at $12 a yard. How much was the cost?
13. Gave $6 a head for sheep, and $12 a head for hogs. How much will 1 sheep and 1 hog cost?
14. What is the cost of 12 pairs of boots at $8 a pair?
15. How many inches are there in 3 yards?
16. How many quarts in 2 bushels?
17. Buy 9 yards of cloth at $5 a yard. How much change should I receive if I offer the trader $50?
18. A lady had a $50 note, a $20 note, and a $5 note. How much money had she left after paying $60 for a cloak?

1. Multiply 245 by 23.

$245 \times 3 = 735$
$245 \times 20 = 4900$
$245 \times 23 = 5635$

USUAL METHOD.

245
23
735 = product by 3 units.
490 = product by 2 tens.
5635 = sum of partial products.

2.	*3.*	*4.*	*5.*	*6.*
532	478	646	753	928
24	35	46	57	83
7.	*8.*	*9.*	*10.*	*11.*
584	976	385	496	839
29	47	93	75	86
12.	*13.*	*14.*	*15.*	*16.*
594	786	2568	3279	4985
56	68	72	37	59

Find the answers to the following by addition; then by multiplication. Which method is shorter?

17. $24 + 24 + 24 + 24 + 24 + 24 = ?$
18. $35 + 35 + 35 + 35 + 35 + 35 = ?$
19. $48 + 48 + 48 + 48 + 48 + 48 = ?$

When can the method of multiplication be used for that of addition?

20. Multiply 123, 345, 567, 789, 987, each by 43.
21. There are 365 days in one year. How many days did Vice President Wilson live, who died at the age of 63 years? Add 15 days for leap years.
22. There are 63 gallons in one hogshead. How many gallons are there in 25 hogsheads?

LESSON LX.

NAME THE PRODUCTS.

1.	*2.*	*3.*	*4.*	*5.*
40	500	600	7000	1200
7	9	8	6	7

6.	*7.*	*8.*	*9.*	*10*
506	908	305	407	804
4	5	8	7	9

11.	*12.*	*13.*	*14.*	*15.*
50 min.	700 min	900 min.	1208 min.	607 min.
9	6	7	5	8

16.	*17.*	*18.*	*19.*	*20.*
$101	$503	$1104	$3070	$1104
9	8	6	5	7

21. $200 + $150 + $8 = ?
22. 80 bu. + 20 bu. + 50 bu. = ?
23. 50 pts. + 90 pts. + 40 pts. = ?
24. 100c. − 50c. − 25c. = ?
25. 500 qts. × 6 = ?
26. 200 × 9 = ?
27. 500 × 8 = ?
28. 40 × 12 = ?
29. 75 × 2 = ?
30. 60 × 5 = ?

What is the cost of

31. 11 pounds of rice, at 7c. a lb.? At 6c. a lb.?
32. 12 barrels of flour, at $6 a bbl.? At $5 a bbl.?
33. 7 pounds of meat, at 9c. a lb.? At 15c. a lb.?
34. 8 pounds of nuts, at 12c. a lb.? At 20c. a lb.?
35. 6 cows, at $50 each? At $70 each?
36. 8 sheep, at $9 each? At $12 a head?
37. 9 books, at $11 each?
38. 12 months' rent, at $20 a month?

To multiply a number by 10, annex to the multiplicand one cipher; by 100, annex two ciphers; by 1000, annex three ciphers; $5 \times 10 = 50$; $85 \times 100 = 8500$; $250 \times 1000 = 250000$.

1. Multiply 42, 75, 143, 250, 837, each by 10.
2. Multiply 29, 55, 89, 104, 980, each by 100.
3. Multiply 45, 67, 92, 120, 375, each by 1000.

4.	*5.*	*6.*	*7.*	*8.*
28	35	47	169	183
20	20	30	40	50
560				

9.	*10.*	*11.*	*12.*	*13.*
46	75	87	142	235
200	200	300	400	500
9200				

14. $38 \times 100 = ?$ $92 \times 300 = ?$
15. $137 \times 54 = ?$ $167 \times 70 = ?$

16. Bought 70 head of horses at \$127 each. How much was paid for them?
17. The salary of the president is \$50,000 a year. How much does he receive in one term of 4 years? In two terms?
18. There are 2000 pounds in one ton of hay. How many pounds of hay can be cut from 12 acres of meadow that yields 3 tons an acre?
19. I agreed to build 15 houses at \$4,000 a house. What was the amount of the contract?
20. What is the cost of 300 sheep at \$13 each?

1. There are 16 ounces in one pound avoirdupois. How many ounces in 5 pounds of tea?
2. Bought 6 oranges and 5 lemons at 8c. each. How much did they all cost?
3. Bought 12 yards of cloth, and 5 yards of velvet, paying $5 a yard for each. How much did I pay?
4. How many days are there in 9 weeks? In 12 weeks? In 20 weeks?
5. Built two fences; one 45 feet long, the other 12 yards long. Which is the longer, and how much?
6. There are 9 square feet in one square yard. How many square feet in a floor that contains 12 square yards?
7. There are 4 quarts in one gallon. What is the cost of 3 gallons of oil at 12c. a quart?
8. There are 3 feet in one yard. What is the cost of 12 yards of iron pipe, at $1 a foot?

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9. Since there are 4 pecks in one bushel, what is the cost of 5 bushels of peaches, at $2 a peck?
10. Bought 5 tons of coal at $5 a ton, and 6 cords of wood at $5 a cord. How much was paid for both coal and wood?
11. What is the cost of one gallon of molasses at 20c. a quart?
12. Paid 75c. for a bushel of potatoes, and sold them at 20c. a peck. How much did I gain or lose?
13. If a boy can earn $2 a day, how much can he earn in 5 weeks, omitting Sundays?
14. Bought 3 boxes of raisins at $5 a box, and 5 boxes of lemons at $3 a box. How much did each cost?
15. Mary reads twice each day. How many times will she read in 4 weeks of 5 days each?

1.	2.	3.	4.	5.
286	475	653	768	825
204	302	405	506	608
1144				
572				
58344				

6. 375×209
7. 692×507
8. 245×908
9. 592×307
10. 749×804
11. 385×407
12. 946×709
13. 589×501
14. 476×605

In the following examples, find the cost of each article, and then find the total amount of each account.

15. GROCERIES.

35 lbs. prunes at 6c. a lb. - - - $.....
85 lbs. coffee at 28c. a lb. - - - .....
74 lbs. raisins at 13c. a lb. - - - .....
28 lbs. tapioca at 14c. a lb. - - - .....

16. DRY GOODS.

45 yds. muslin at 9c. a yd. - - - $.....
38 yds. cashmere at 85c a yd. - - - .....
57 yds. flannel at 65c. a yd. - - - .....
26 yds. velvet at $1 a yd. - - - .....

17. FUEL.

14 tons hard coal at $6. - - - $.....
18 tons soft coal at $3. - - - .....
37 tons coke at $3. - - - - .....
36 cords wood at $6. - - - - .....

18. MEATS.

145 lbs. beef at 13c. - - - - $.....
257 lbs. pork at 11c. - - - - .....
88 lbs. veal at 16c. - - - - .....
65 lbs. mutton at 12c. - - - - .....

1. John counted 7 units and Mary 6 twelves. How many more units did Mary count than John?
2. In a cornfield there are 8 rows of corn, having 9 hills in each row; in another there are 8 rows, having 10 hills in each row. How many hills in each field?
3. There are 8 furlongs in one mile. How many furlongs are there in 9 miles and 6 furlongs?
4. Since there are 12 inches in one foot, how many inches are there in 12 feet and 6 inches?
5. A squirrel carried into his nest 5 acorns each day for 2 weeks. How many acorns did he gather?
6. A farmer sold 5 tons of hay at $12 a ton, and took in exchange flour worth twenty dollars, and the remainder in cash. How much cash did he receive?

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7. One farmer took to market 8 turkeys, weighing 12 pounds each, and another took geese weighing 18 pounds. How much more or less did the turkeys weigh than the geese?
8. Bought 12 yards of ribbon, at 12c. a yard, and gave in payment 120c. How much do I still owe?
9. Two boys start from the same place and travel in the same direction, one at the rate of 5 miles hour, the other at the rate of 7 miles an hour. How far apart will they be in 12 hours?
10. Two men start from the same place and walk in opposite directions, one at the rate of 4 miles, the other at the rate of 3 miles an hour. How far apart will they be in 12 hours?
11. Bought my winter's coal for $108, and gave in payment 12 barrels of flour at $8 a barrel, and the rest in cash. How much cash did I give?

1. In one cubic foot there are 1728 cubic inches. How many cubic inches in 96 cubic feet and 1245 cubic inches?
2. How far will a locomotive travel in 2 weeks, omitting Sundays, at the rate of 28 miles an hour for 8 hours each day?
3. What is the cost of 1675 chests of tea, each chest containing 67 pounds, at 45c. a pound?
4. What is the cost of 19 car loads of wheat, each car containing 560 bushels, at 85c. a bushel?
5. Find the value of 96 pieces of cotton cloth, averaging 36 yards to a piece, at 8 cents a yard

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6. A house is worth $2450; the lot is worth 3 times as much. What is the value of both?
7. A farm is worth $9150; the stock on it is worth one third as much as the farm. Find the value of both farm and stock.
8. If a person receives an annual salary of $1875, and expends each year $312 for board, $105 for clothing, and $275 for other purposes, how much can he save in one year?
9. I bought 158 tons of coal at $6 a ton, and paid $575. How much do I still owe?
10. 17 hogsheads of sugar average 918 lbs. in weight. What is their total value, at 5 cents a pound?
11. I bought 320 acres of land for $18 an acre, and sold it all for $6000. Did I gain or lose, and how much?

1. Sold 12 yards of cloth at $5 a yard, receiving in payment $38; how much was unpaid?
2. Traveled on a journey afoot for 6 days at 12 miles a day, how many miles must I yet walk to have traveled 100 miles?
3. How many trees left in an orchard of 86 trees, if 6 rows of 9 trees each are destroyed?
4. Since there are 4 pecks in one bushel, how many pecks are there in 9 bushels and 3 pecks? In 12 bushels and 2 pecks?
5. Since there are 12 inches in one foot, how many inches are there in 6 feet and 6 inches? In 9 feet 7 inches? In 12 feet 8 inches?
6. Since there are 8 furlongs in one mile, how many furlongs are there in 7 miles and 5 furlongs? In 9 miles and 6 furlongs? In 12 miles and 7 furlongs?
7. A lady bought a gold chain weighing 2 pennyweights 12 grains. How many grains did it weigh, if there are 24 grains in one pennyweight?
8. Bought 5 ounces 15 pennyweights of gold, at $1 per pennyweight. How much did it cost if there are 20 pennyweights in one ounce?
9. Find cost of 12 gallons 2 quarts of oil at 10c. a quart; There being 4 quarts in one gallon.
10. At 8c. each, how much will 4 doz. and 2 lead pencils cost?
11. Find cost of 3 gallons and 3 quarts of syrup at 60 cents a gallon.
12. What is the average weight of 3 boxes which weigh respectively, 13 lbs., 24 lbs and 17 lbs.?
13. What is the average age of 4 boys who are, respectively, 8 years, 10 years, 12 years, and 6 years old?

REVIEW—WRITTEN.

1. From the sum of \$169.005, \$2001.10, \$97.37½, \$102.305, \$85.02, subtract \$1809.02.
2. Find the difference of 1868 × 35 and 3964.
3. A man earned \$2000 a year. He pays \$6 a week for board, \$456 for clothes and \$318 for other expenses. How much can he save in 1 year?
4. What is the cost of feeding 27 horses 48 weeks, at \$4.50 a week?
5. What will a bushel of potatoes cost, if ½ peck is worth 35 cents?
6. If I can save \$568 from my income a year, how much less than \$5000 can I save in 8 years?

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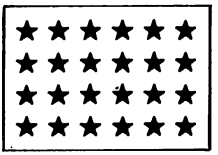
7. I paid \$28 an acre for 1575 acres of land and \$2345 for improvements. Find the whole cost.
8. Which are worth more, 345 acres of land at \$38 an acre, or a farm worth \$7480?
9. A man paid for a house \$2725, which was ⅕ of all his money. How much money had he left?
10. On each side of a street are 69 trees; what did they all cost to plant, at \$25 each?
11. A bought of B 563 acres of land, at \$48 an acre, and gave in payment a house worth \$3756; how much did he still owe?
12. A miller sold 650 barrels of flour, each weighing 196 pounds, at 3c. a pound; for how much did he sell the flour?
13. If I sell for \$875, 7 yoke of oxen for which I had paid \$84 a yoke, do I gain or lose, and how much?
14. How many hours do I waste in one year (52 weeks), if I am idle 2 hours every day?

DIVISION



1. How many stars in this group?
2. How many 6's in 24? How many 4's in 24?
3. 6 is contained in 24 how many times?
4. 4 is contained in 24 how many times?
5. How many groups of 6 stars each can be made out of the 24 stars?

This use of *division* is to find how many *equal parts* there are in a number when the number of units in each part is known.

6. If 24 stars be divided into 4 groups, how many stars in each group?
7. If 24 stars be divided into 6 groups how many stars in each group?
8. Divide 24 into 2 equal parts. How many units in each part?

This use of *division* is to find how many *units* there are in one of the equal parts of a number when the number of parts is known.

9. Make 15 marks on the board and divide them into groups of 3 each. How many groups have you?
10. Divide them into 3 groups. How many in each group?

15 (marks), the number to be divided, is the *dividend.* 3 is the *divisor.* 5, the result obtained by division, is the *quotient.* The divisor and quotient are factors of the dividend. $15 \div 3$ is read 15 divided by 3.

Find the number of times each divisor is contained in the dividend written with it, in the following examples:

1.	2.	3.	4.
\$11)\$69	\$11)\$90	\$11)\$100	\$11)\$110
6...\$3 rem.			

5.	6.	7.	8.
\$12)\$75	\$12)\$100	\$12)\$120	\$12)\$125

9.	10.	11.	12.
4)144 = 120 + 24	4)186	4)188	4)220
36 = 30 + 6			

13.	14.	15.	16.	17.
5)125	5)130	5)145	5)165	5)175

18.	19.	20.	21.	22.
6)132	7)154	8)184	9)198	9)225

23.	24.	25.	26.	27.
7)182	8)192	8)216	9)234	9)252

28.	29.	30.
4)532 = 400 + 120 + 12	4)544	4)556
133 = 100 + 30 + 3		

31.	32.	33.	34.	35.
5)630	5)645	6)732	6)756	7)868

36.	37.	38.
6)1476 = 1200 + 240 + 36	6)1764	6)2514
246 = 200 + 40 + 6		

39. 7)2268 8)2936 8)3384 9)2097 9)2925

1. If $63 was paid for 9 yards of cloth, what was the cost of one yard?
2. A gentleman paid $72 for 12 head of sheep. What was the cost of one sheep?
3. There are 8 "shillings" in one dollar. How many dollars are there in 72 "shillings"?
4. Paid 96c. for 12 yards of ribbon. What was the cost of one yard?
5. If a man can dig 84 feet of trench in 7 days, how many feet can he dig in one day?
6. If 5 yards of silk cost $15, what cost 8 yards?
7. If 6 men can do a piece of work in 12 days, how long will it require 8 men to do the same?
8. What is the cost of 20 oranges, if 9 oranges cost 45c.?
9. How many tons of coal at $6 a ton will pay for 12 barrels of flour at $5 a barrel?
10. A gentleman bought 12 yards of velvet at $3 a yard, and gave in payment flour, at $6 a barrel. How many barrels did he give?
11. If 8 quarts of molasses cost 72c., how much will $\frac{1}{3}$ of 15 quarts cost?
12. If 9 men can mow 36 acres in one day, how much can 12 men mow in the same time?
13. If 6 men can build a boat in 14 days, how long will it require 7 men to do it?
14. If 9 pounds of sugar cost 108c., how much will $\frac{1}{4}$ of a pound cost?
15. How much will 9 barrels of cider cost, if 5 barrels cost $45?
16. If 12 dozen eggs cost $2.40, what is $\frac{1}{4}$ dozen worth?
17. A good sized horse is 16 hands high. How many inches is that? (The hand-measure is 4 inches.)

1. Divide 1812 by 6.

Divisor, 6)1812, Dividend. 6)1800 + 0 + 12

302, Quotient. 300 + 0 + 2

PROOF: *Quotient* × *Divisor* = *Dividend.*

302 × 6 = 1812

2.	6)1218	6)1824	6)2430	6)3648	6)4254
3.	7)1421	7)2135	7)2807	7)3542	7)4956
4.	8)1608	8)2432	8)3248	8)4056	8)4864
5.	9)1818	9)2745	9)3654	9)4572	9)8163
6.	8)7256	8)3656	8)7576	8)9352	8)1032
7.	9)8892	9)3978	9)3565	9)3288	9)7356

PROOF:

8. 7)1569 *Quotient* × *Divisor* + *Remainder* = *Dividend.*

224...1 rem. 224 × 7 + 1 = 1569

9.	2)273	3)346	4)450	4)575	5)777
10.	6)368	6)680	7)479	8)703	9)888
11.	6)1479	6)3338	6)2450	6)3567	6)7335
12.	7)2565	7)4733	7)6456	7)9350	7)5870
13.	8)7058	8)3646	8)7577	8)2939	8)6735
14.	9)8895	9)3979	9)2560	9)6328	9)5670

1. Gave $63 for 9 tons of coal. How much should be paid for 12 tons at the same rate.
2. Gave $48 for 4 yards of silk. How much will 24 yards cost, at the same rate?
3. If 12 boxes of oranges cost $72, how much will 8 boxes cost?
4. Paid 80c. for 4 quires of paper. How much should be paid for 9 quires?
5. If 6 men can do a piece of work in 12 days, in what time can 1 man do it? Can 9 men do it?
6. How many men can do as much in 6 days as 5 can do in 1 day? In 12 days?
7. How many men can build a wall in 10 days, if 5 men can build it in 20 days?
8. What is the cost of 16 yards of cloth, if 12 yards cost $24?
9. If 8 acres of land cost $320, how much will 3 acres cost?
10. What is the cost of 15 pounds of coffee, if 1 pound is worth 20c.?
11. How much will 12 yards of silk cost, if 8 yards cost $16?
12. If 8 men can dig a trench in 20 days, how many will be required to do it in 16 days?
13. What will be the cost of 9 yards of cashmere, if the price of 3 yards is $2.40?
14. What is the cost of 16 bushels of wheat, if 2 bushels are worth $1.80?
15. If 12 yards of ribbon cost 84c., how much will 18 yards cost?
16. How many tons of coal, at $6 a ton, may I exchange for 9 barrels of flour, worth $8 a barrel?
17. If 20 barrels of flour are worth $80, what is the value of a sack of flour, containing $\frac{1}{8}$ barrel?

REVIEW.

1.	6)1884	6)2754	6)4050	6)5202	6)7008
2.	7)1568	7)3198	7)3794	7)6097	7)8988
3.	8)1944	8)2184	8)4072	8)5392	8)7976
4.	9)2187	9)4878	9)5004	9)8109	9)9702

5. A carpenter received $168 for building 6 rods of fence. What was the cost per rod?
6. A traveler goes 7 miles an hour. In how many hours will he travel 259 miles, if he continues at the same rate?
7. How many days will 2106 reams of paper last a publisher, if he uses 9 reams a day?

8.	5)3827	6)4306	7)5092	8)6939	9)7056

9. In how many days can 8 men do 456 days' work?
10. At 9 cents a pound, how many pounds of sugar can be bought for 2664 cents?
11. The tuition received at a certain private school was $2025 for one term. How many pupils attended, if each was required to pay $9?
12. Four quarts equal one gallon. How many gallons in 1625 quarts?
13. A man bought some sheep for $296, paying $8 each. How many did he buy?
14. Two men are 1225 miles apart; they are walking toward each other. One travels at the rate of 5 miles an hour, and the other at the rate of 4 miles an hour. In how many hours will they meet?

LESSON LXXIV.

1. $\frac{1}{4}$ of \$40 is what I gave for 5 yards of cloth. What is the price of one yard?
2. $\frac{1}{8}$ of \$40 is what was paid for 5 sheep. What did one sheep cost?
3. Paid \$60 for 12 barrels of flour. At what price per barrel should it be sold so that \$12 may be gained?
4. I sold 12 dozen pens for 84c., which was at a loss of 12c. How much did they cost per dozen?
5. What is the cost of 10 sheep, if 8 sheep cost \$56?
6. A wagon cost \$60, which is 5 times the cost of the harness. What is the cost of both the harness and the wagon?
7. A watch cost \$120, which is 4 times the cost of the chain. What is the cost of the chain?
8. Paid \$96 for a sleigh, which was 12 times the cost of the bells. What was the cost of the bells? Of both?
9. \$60 is \$3 less than the cost of 9 barrels of salt. What was the salt a barrel?
10. If 8 pounds of coffee cost \$1.60, how much will $\frac{1}{4}$ of a pound cost?
11. A tree is 72 feet high, which is 9 times the distance around it at the base. How many feet around the base?
12. Bought 12 yards of velvet at \$3 a yard, and sold it at a gain of \$24. What was the selling price?
13. Paid \$75 for 25 sheep, and soon after sold them at a gain of \$25. How much was received for each?
14. Bought at one time 8 barrels of flour at \$5 a barrel, and 4 barrels at \$6 a barrel. What was the total cost?
15. How much will be the wages for one year, if 4 months' wages amount to \$48?

1. Divide 55367 by 23.

2407, Quotient.
23)55367, Dividend.
46
93
92
167
161
6, Rem.

When the products and remainders are so large that it is difficult to carry them in mind, they may be written as shown in the example here solved. This process is called "LONG DIVISION." The quotient may be written above or to the right of the dividend.

TABLE OF MULTIPLES.

23 ×
1 = 23
2 = 46
3 = 69
4 = 92
5 = 115
6 = 138
7 = 161
8 = 184
9 = 207

To avoid "guess-work" it will aid the pupil to make a table of multiples until he becomes familiar with the long division process.

The successive partial dividends in this example are 55, 93, 16, and 167. From the table it will be seen that there are two 23's in 55, four 23's in 93, no 23's in 16 (place a zero in the quotient and bring down the next figure of the dividend), and seven 23's in 167; after dividing all the figures of the dividend there is a remainder of 6.

PROOF.

2407, Quotient.
23, Divisor.
7221
4814
55361
6, Remainder.
55367 = Dividend.

PROOF: *The dividend always equals the product of the quotient and divisor, plus the remainder.*

2. 11)143 11)176 11)242 11)585 11)708

3. 12)156 12)192 12)385 12)518 12)930

4. 13)156 13)286 13)405 13)753 13)895

To Divide by 10, 100, or 1000.

Any integral number may be divided by 10, by 100, by 1000, etc., by pointing from the right of the dividend as many figures as there are ciphers in the divisor.

Thus, $2846 \div 10 = 284.6 = 284$ and 6 tenths.
$2846 \div 100 = 28.46 = 28$ and 46 hundredths.
$2846 \div 1000 = 2.846 = 2$ and 846 thousandths.

1. Divide 349 by 10.
2. Divide 867 by 10.
3. Divide 3468 by 100.
4. Divide 7962 by 100.
5. Divide 6459 by 100.
6. Divide 8678 by 100.
7. Divide 18469 by 100.
8. Divide 6984 by 100.
9. Divide 1649 by 100.
10. Divide 2564 by 1000.

If a divisor ends in one or more ciphers, point from the right of the dividend as many figures as there are ciphers on the right of the divisor; divide what is left of the dividend by the significant figures of the divisor. To the remainder, if any, annex the figures separated from the right of the dividend.

1. Divide 643 by 90.

Process:
$643 \div 90 = 64.3 \div 9 = 7$ and 13 remainder.

2. Divide 7264 by 600.

Process:
$7264 \div 600 = 72.64 \div 6 = 12$ and 64 remainder.

3. Divide 323 by 40.
4. Divide 457 by 50.
5. Divide 345 by 60.
6. Divide 8269 by 70.
7. Divide 3592 by 500.
8. Divide 18310 by 200.
9. Divide 45567 by 300.
10. Divide 538 by 200.
11. Divide 795 by 300.
12. Divide 946 by 400.
13. Divide 894 by 500.
14. Divide 3657 by 6000.
15. Divide 4289 by 7000.
16. Divide 5648 by 8000.

Divide each of the dividends given below, using as a divisor, one day 13, the next day 14, the third day 15, etc., to 20. Each pupil should make a table of multiples for each divisor. (If further practice of this kind should be desired, the teacher may assign as divisors, successively, 21, 22, 23, 24, etc.)

1.	65	73	94	89	47	56
2.	78	39	57	68	99	71
3.	63	87	76	96	46	85
4.	118	154	172	120	156	188
5.	213	237	248	253	269	293
6.	275	287	295	226	203	347
7.	3123	3234	3345	3456	3567	3785
8.	4678	5788	6879	7890	8901	8493
9.	9012	8123	7243	6542	5987	9648

10. If 17 cows are worth \$816, what is one cow worth? How much are 48 cows worth?
11. If 18 acres of land are worth \$3366, for how much per acre should it be sold so that \$720 may be gained?
12. How many tons of coal at \$9 a ton will pay for 84 thousand feet of lumber at \$36 per thousand feet?
13. By selling 13 acres of land for \$585, I lose \$52. What is the cost per acre? Cost of 160 acres?
14. If 180216 square rods of land be divided equally among 12 men, what is the value of each man's share at \$4 per square rod?
15. $\frac{1}{9}$ of \$42075 is what a gentleman paid for a house and lot, which was \$568 more than what he sold them for. How much was received for them?

1. Henry is 3 times as old as Mary. If her age is 12 years, what is the sum of their ages?
2. What will be the sum of their ages 8 years hence?
3. In a certain school there are 60 pupils. One fourth of them are boys. How many girls in the school? How many more girls than boys?
4. There are 84 cows and sheep in a field; one seventh are sheep. How many cows in the field? How many more cows than sheep in the field?
5. A man bought a horse and a wagon for $210. For the wagon he paid one third of the amount. What is the cost of the wagon? Of the horse? How much less did the wagon cost than the horse?
6. Mr. Stone paid $150 for a carriage and one third as much for a harness. Find the cost of the harness. Of both.
7. John has 75 cents and James has one third as much. How much money have both?
8. A has $8, B has $10, and C five times as much as B. What is the sum of their money?
9. Mr. Page bought a suit of clothes and overcoat for $56. Of this amount $\frac{3}{7}$ was paid for the overcoat. What did the overcoat cost? Find the cost of the suit.
10. If a sofa and table cost $35, and the table costs $\frac{2}{5}$ of that amount, what does the sofa cost?
11. A lot is worth $1200 and the house on it twice as much. Find the cost of the house. Of both.

12. 2 bushels are how many pecks? Quarts? Pints?
13. 160 pints are how many quarts? Pecks? Bushels?
14. 3 bushels 1 peck are how many pks.? How many qts.?
15. 12 pecks 5 qts. are how many qts.? How many pts.?
16. 50 quarts 1 pint are how many pints?

1. A factory is worth $48000. Mr. A. owns $\frac{1}{6}$ of it, and Mr. B. owns $\frac{1}{8}$ of it. What is the value of what they both own?
2. A gentleman owned $\frac{1}{12}$ of a tract of land of 12960 acres, and divided it equally among his 8 children. How many acres did each receive?
3. A grain dealer delivered to a customer 3240 pounds of wheat. There are 60 pounds in one bushel. How many bushels did he deliver?
4. If 25 bushels of oats weigh 800 pounds, how many pounds will 75 bushels weigh? How many pounds will a carload of 536 bushels weigh?

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5. A, B, and C bought a farm for $9580; A paid $2540, B paid $3275, and C the remainder. How much did C pay?
6. Bought a tract of land and divided it into 22 house lots, which I sold at $348 each, thereby gaining $2912. What was the total cost?
7. One ninth of a tract of 720 acres was divided into 8 equal lots. How many acres did each lot contain?
8. Mr. A sold 2460 pounds of wool at 45c. a pound. How many pounds at 25 cents a lb. could he have bought for the same money?
9. Mr. B. saved $921 one year, and $1143 the next year. He paid $\frac{1}{12}$ of these savings for a wagon: how much did he pay for the wagon?

LESSON LXXX.

REVIEW—WRITTEN.

1. Divide the number 25632 into equal parts of 18 units each. How many *parts* are there? Divide it so that there shall be 24 equal parts. How many *units* in each part?
2. A man sold 64 calves at $7 each, and thereby gained $169. How much had he paid for them?
3. $\frac{1}{12}$ of $8400 equals in value how many $20 bills?
4. How many 14's in 75868? How many 23's?
5. The quotient is 2463, the divisor is 21 and the remainder is 7. What is the dividend?
6. The product of two numbers is 9146, and one of the numbers is 17. What is the other?

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7. How many 24's are contained in 9547? What is the remainder?
8. A farmer sold 15 acres of land for $2070, and thereby gained $405. Find the cost per acre.
9. Mr. Monroe bought 19 cows for $526, and fed them at an expense of $7 per head. What was the total cost of the cows?
10. A man sold 155 acres of land at $38 per acre, and took in payment for it other land at $19 an acre. How many acres did he get?
11. If a ship can sail 264 miles per day, how far can she sail in an hour?
12. A farmer purchased 320 acres of land. Retaining 296 acres, he sold the rest for $3072. How much did he get per acre?
13. How many days in 8760 hours?

A BOY'S CASH ACCOUNT.

Cash, March, 1887.

1887.			Received.		Paid.	
Mar.	1	Cash on hand	7	85		
"	4	Sold 5 doz. eggs, @ 25¢	1	25		
"	5	Bought 3 books, @ 45¢			1	35
"	8	Sold 2 hens, @ 55¢				
"	15	" 7 doz. eggs, @ 25¢				
"	16	Bought 75 lb. feed, @ 1¢				
"	16	" U. S. History				75
"	25	For running errands		50		
"	26	Sold my skates	1	75		
		Balance			11	35
			14	20	14	20

INSTRUCTIONS.—Money received is entered in column marked "Received." Money paid is entered in column marked "Paid." At the close of the month find the sum of each column, and subtract the amount *paid* from the amount *received*. Enter the difference as "Balance" in column "Paid," and find sum of each column. The "Balance" is entered as "Cash on hand" on the first day of the next month.

Dr. April, 1887.

1887.			$	¢
Apr.	1	Cash on hand	125	60
"	2	Week's salary	18	00
"	7	Sold 4 oil barrels, @ 75¢	3	00
"	9	Week's salary	18	00
"	12	Sold 16 chickens, @ 22¢	3	52
"	15	Cash from White & Co.	6	50
"	16	Sold 1 Jersey cow	42	00
"	16	Week's salary	18	00
"	23	" "	18	00
"	30	" "	18	00
			270	62

May, 1887.

May	1	Cash on hand	167	38

April, 1887. Cr.

1887.			$	¢
Apr.	1	House rent for April,	24	00
"	1	Grocer's bills, (March,	21	65
"	1	(Market " "	6	92
"	5	1 suit of clothes	15	50
"	6	1 load of hay	11	50
"	9	Dry goods	4	85
"	16	Dress-making	9	00
"	20	In charity	3	52
"	23	History of U. S.	6	30
"	30	Balance	167	38
			270	62

May, 1887.

May				

TABLE OF LINEAR (OR LONG) MEASURE.

12	inches (in.)	=	1 foot (ft.)
3	feet	=	1 yard (yd.)
$5\frac{1}{2}$ yards $16\frac{1}{2}$ feet		=	1 rod (rd.)
320	rods	=	1 mile (m.)

1. How many inches in 3 feet? 5 feet? 10 feet?
2. 48 inches equal how many feet? 144 inches?
3. What part of a foot is 6 inches? 4 inches? 8 inches?
4. A common door is 6 feet 8 inches high? What is the height of the door in inches?
5. A country road is usually 22 yards wide. How many feet wide is it?
6. 30 yards equal how many feet?
7. How many feet in 5 yards and 2 feet?
8. How many inches in 1 yard, 1 foot and 2 inches?
9. How many rods in $\frac{1}{4}$ of a mile? $\frac{1}{2}$ mile?
10. Two rods equal how many yards? 4 rods?
11. What is the cost of 6 feet of ribbon at 12c. a yard?
12. What is $\frac{1}{8}$ of a mile expressed in rods?
13. One eighth mile is sometimes called a *furlong.* How many rods in a furlong?
14. Two furlongs are what part of a mile?
15. How many miles in 40 furlongs?
16. At 10 cents a mile, what will it cost to convey a man $5\frac{1}{2}$ miles and back again?
17. How much less than a mile did a man go, who walked 295 rods?
18. A boy, taking 8 steps to a rod, will take how many steps in walking one mile?

1. $5\frac{1}{2}$ times 276 are how many?

   REMARK: *276×5, plus 276÷2=the answer.*

2. How many yards in 28 rods? In 1 mile?
3. How many feet in 42 rods? In 320 rods?
4. In measuring the depth of the ocean, a unit 6 feet long, called *fathom*, is used. How many feet in 20 fathoms? In 40 fathoms?
5. Find the cost of 52 yards of rope, at $2\frac{1}{4}$c. a foot.
6. What is the cost, at 9c. a foot, of a strip of border long enough to go around the walls of this room?

   REMARK: *One pupil may measure the room for the entire class and place the result on the board. Count parts less than 12 inches as one foot.*

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7. Find the number of inches of wall between the doors and windows of this room. How many strips of paper 18 inches wide are required to paper the parts of the walls measured?
8. How many boards, 8 inches wide, are required to build a sidewalk in front of this school-yard?
9. How many steps, each 2 feet long, will a boy take in going 3 miles?
10. What is the cost for the tile, at 15c. a foot, to put into a drain 36 rods long?
11. What is the cost of paving a street, 48 yards long, at $6 a linear yard?
12. What is the price paid for a lot, having 22 yds. front, at $25 a foot?
13. A person bought a lot of ground for $4752. He divided it into 6 lots, which he sold at $980 a lot. How much did he gain by the transaction?

TABLE OF AVOIRDUPOIS WEIGHT.

16 ounces (oz.)	=	1 pound (lb.)
100 pounds	=	1 hundredweight (cwt.)
20 hundredweight	=	1 ton (T.)
2000 pounds	=	

This weight is commonly used in buying and selling articles. The unit is the *pound.*

1. How many ounces in 2 pounds? In 5 pounds?
2. How many oz. in $\frac{1}{2}$ lb.? In $\frac{1}{4}$ lb.? In $\frac{3}{4}$ lb.?
3. 32 oz. equal how many pounds? 24 oz.?
4. How many pounds in $\frac{1}{2}$ cwt.? In $\frac{1}{4}$ cwt.?
5. $\frac{1}{2}$ ton equals how many pounds? $\frac{1}{4}$ ton?
6. A teamster had a load of iron weighing 2 tons. How many pounds did the load weigh?
7. How many barrels of pork weigh a ton, there being 200 pounds in a barrel?
8. A keg of nails weighs 100 lbs.? How many kegs in a load weighing $1\frac{1}{2}$ tons?
9. A grocer weighs $1\frac{1}{2}$ lb. of butter. What weights does he use?
10. How many 4-oz. weights are required to weigh $1\frac{1}{4}$ lbs.? $\frac{3}{4}$ lb.? 2 lbs.?
11. What is the cost of 1 lb. 4 oz. of canary seed at 2 cents an oz.?
12. What is the value of 2 oz. of sunflower seed at 40c. a lb.?
13. 32 lbs. equal 1 bushel of oats. How many lbs. in 1 pk.? 1 qt.? In a sack holding 2 bu.?

1. 760 mills equal how many cents.
2. $35 and 45 dimes equal how many dimes?
3. A butcher bought a beef weighing 584 lbs., at an average price of 9c. a lb. How much will he gain if he sells the meat at an average price of 12 cents a pound?
4. I bought 1 ton of millet seed for $20, and sold it at 5 cents a lb. Find the gain.
5. How many lbs. in two tons, 7 cwt. and 25 lbs?
6. How many pounds in 3600 oz.? In 1256 oz.?
7. Find the cost of 2 bu. 3 pks. of cherries at 7 cts. a quart.
8. What cost 144 qts. of gooseberries at 50 cents a peck?
9. What is the value of a pint of alcohol at $2 a gallon?
10. What is the cost of $4\frac{1}{4}$ lbs. of cinnamon at 8c. an oz.?

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11. Find the value of 5 lbs. 8 oz. of pepper at 20 cents a lb.?
12. A farmer sold 13 tubs of butter, averaging 52 lbs. each, at 26c. a lb. For how much did he sell his butter?
13. A load of hay with the wagon weighs 2820 lbs. The wagon weighs 920 lbs. Find the value of the hay at 75c. a cwt.
14. If a man can reap 7 acres a day, in how many days can he reap three fields containing, respectively, 84 acres, 147 acres, and 224 acres?
15. A merchant bought 9 pieces of cloth at $2 a yard, and paid $360 for all. How many yards did the pieces average?
16. A merchant exchanged 270 bbls. sugar at $22.50 per bbl. for flour at $5 per bbl. How many bbls. of flour did he receive?
17. If 250 bbls. of pork, which cost $18 a bbl., be sold for $21 a bbl., how much money is gained?

1. If I buy nine four-cent stamps, and give, in payment, a 50c. piece, how much change should I receive?
2. A man hired 8 boys to do some work, agreeing to give them 5c. each. When he paid them he had a $2 bill, with which he stepped into a store and received the least number of pieces in change that would enable him to pay the boys. What and how many pieces did he receive?
3. I gave $1 in payment for 18 two-cent stamps. How much change should I receive?
4. I leave the school-house at half-past three in the afternoon and return in the morning at a quarter before nine. How many hours from the time I leave the school-house until I return?
5. There are 288 pages in a book. What are the two middle pages numbered? If the book has 288 leaves, what are the two middle pages numbered?
6. A boy earns $6 a week. What will he save at the end of 14 weeks, if he spends one week's earnings?
7. What is the postage at ½c. an ounce on a package weighing 4 oz.? 1½ lbs.? 3 lbs.?
8. If a man buys old iron at ½c. a pound, how much will he pay for 86 lbs.? For 240 lbs.?
9. I hired a dozen boys to do a certain work, agreeing to give them 15 cents each. When I paid them, what pieces of money did I need, and how many of each?
10. A street car, going "down," carried 25 passengers, and going "up," 45. How much fare, at 5 cents each, was collected on the round trip?
11. A block of houses is 240 yards long and 200 yards wide. How far does a boy go who walks around it?
12. 50c. less the cost of 18 pencils at 2c. each equals what?

1. A fruit dealer sold 25 barrels of nuts, each containing 3 bushels, at $8 a bushel, and gained $75. What was the total cost.
2. A farmer picked from one tree 2 bush. of apples; if he has 13 trees bearing the same quantity of apples, how many barrels can be filled from them, allowing 3 bushels to one barrel? How many bushels remainder?
3. 25 cattle were found to weigh 9925 pounds. If they were of equal weight, how much did 17 of them weigh?
4. A miller saves $1 a day, every day except Sunday. How many months, counting 26 days to the month, will it take to pay for a horse and wagon worth $136, and a mortgage on his house of $464.

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5. A colony of 121 persons contribute $945 each towards the purchase of land. How many acres, at $21 per acre, can they buy?
6. A brickmaker has 3 kilns, one of which contains 36520 bricks, and each of the others as many; after disposing of 40380 bricks, he sold the remainder in 18 loads. How many bricks did he sell?
7. Find the product of four thousand ninety, and eight hundred seventy, and divide it by 15.
8. A drover sold 954 sheep for $7 a head, and thereby lost $1908. How much had he paid for them? What was the average loss a head?
9. If 260 acres of land cost $4160, what will 327 acres cost at the same rate?
10. What is the cost of 189 horses, at the rate of 27 horses for $5076.

SEE TABLES IN APPENDIX.

1. Find the cost of 50 ft. of rope, at 4 cents a foot.
2. What cost 8 yds. calico, at $12\frac{1}{2}$ cents a yard?
3. Find the cost of 2 gal. of alcohol, at 60 cents a quart?
4. If 9 square yards of carpet cost $18, what is the cost of 20 square yards?
5. What is the cost of 15 lbs. of sugar, if 12 lbs. cost 96 cents?
6. What is the cost of 12 bu. oats, if 5 bu. cost $2.00?
7. If 4 yds. of cloth cost $16, what is the cost of 9 yds. at the same rate?
8. If 20 gal. wine are worth $10, what is the value of 17 gal. of the same article?
9. If 15 cords of wood are worth $45, what is the value of 11 cords?
10. Cost of 5 cwt. of flour, if 12 cwt. cost $48?
11. What is the cost of 3 bu. corn, at 10c. per pk.?
12. What is the cost of 4 bu. wheat, at 20c. per pk.?
13. What is the cost of 5 pk. of potatoes, at 3c. per qt.?
14. Cost of 2 lbs. cinnamon, at 10c. per oz.?
15. Cost of 2 T. iron, at $3 per cwt.?
16. Cost of 9 yds. cord, at 3c. per foot?
17. Cost of 1 hhd. wine, at $2 per gal.?
18. Cost of 2 bbls. vinegar, at 20c. per gal.?
19. Cost of 4 gals. milk, at 5c. per qt.?
20. Cost of 3 lbs. honey, at 2c. per oz.?
21. Cost of 4 oz. sago, at 12c. per lb.?
22. Cost of half a dozen thimbles, worth 72c. a gross?
23. At 80c. a gal., what is the value of 1 qt. of syrup?
24. What is the cost of grading 80 rods of road at $160 a mile?
25. Find the cost of 18 yds. silk, at $3 per yd.
26. What is the rent of a house, a year, at $20 per month?

SEE TABLES IN APPENDIX.

1. Find cost of 30 bu. of beans, at 45c. per pk.
2. Find cost of 21 gals. cider, at 4c. per qt.
3. Find cost of 3 tons nails, at 3c. per lb.
4. Find the total weight in pounds, of:
   3 kegs (100 lbs. each) of nails.
   25 barrels of flour.
   5 tons of iron and 2 tons of lead.
5. How many feet in 2 miles?
6. If 1 cwt. of metal costs $5, how much will 2 tons cost?
7. If one pound of butter is worth 28c., what is the value of 5 tubs weighing, respectively, 54 lbs. 3 oz., 48 lbs. 5 oz.? 61 lbs. 9 oz., 56 lbs. 4 oz., and 51 lbs. 3 oz.?
8. Find the cost of 12 bu. 3 qts. of peas, at 8c. a quart.
9. What is the cost of 40 rods of sewer pipe, at $2 a foot
10. At $1 a foot, how many yards of lead pipe can be purchased for $138?

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11. How many years will it take a man to save $2880, if he save $24 a month?
12. How long will a barrel of oil, containing 51 gallons, last, if a quart be burned every day?
13. What is the value of $1\frac{1}{2}$ tons sugar, at 6c. a pound? What is gained by selling it at $7\frac{1}{2}$c. a lb.?
14. What is the cost of forty-eight 112-lb. kegs of pearl barley, at 7c. a pound?
15. Find the cost of 9 bbls. of oatmeal, each containing 200 lbs., at 5c. a lb.
16. What is the value of 250 lbs. rice, at $5\frac{1}{2}$c. a lb.?
17. What is the cost of 150 pails lard, at 35c. a pail?
18. What is the cost of 145 6-lb. cans of meat, at 9c. a lb.?

1. I pay for room rent $3 a month, and for office rent $9 a month. What rent do I pay in a year?
2. What 5 equal numbers make 75?
3. If it requires 64 rods of fence to go around a square lot, how many rods on one side of the lot?
4. If there are 29 lbs. on one scale pan, and 15 lbs. on the other, how many pounds must be taken from one pan and put into the other to make the scales balance?
5. John's kite string is 112 yards long, and Henry's is 84 yards long. How much of his string must John give to Henry so that both strings may be equal?
6. The sidewalk in front of our lot is 3 times long as that of our neighbor. His is 400 feet in length. Find the length of both sidewalks.
7. Mr. Jones bought a turkey, weighing 15 lbs., at 11c. a pound. What was the cost of the turkey?
8. How much change should Mr. Jones receive if he gave a $2 bill in payment for the turkey?
9. How much change would he have received had the turkey weighed 2 pounds more?
10. A bushel of wheat weighs 60 pounds. What will 8 bushels weigh? What is the cost of that amount at 90c. a bushel?
11. How many oranges, worth 4 cents each, must be given for 16 lemons, worth 3 cents each?
12. How many pounds of fish, worth 7 cents a pound, can be purchased for 63 cents?
13. 164 marbles were equally divided among a certain number of boys. How many boys were there, if each received 4 marbles?
14. If 15 sheep cost $75, what will 25 sheep cost?
15. If 8 tons of hay cost $112, what will $\frac{1}{2}$ ton cost?

Find the amounts of the following sales:

1. 48 bbls. syrup, averaging 31 gals., @ 40c. a gal.
2. 56 bbls. sugar, averaging 220 lbs., @ 4c. a lb.
3. 24 bbls. coffee, averaging 248 lbs., @ 18c. a lb.
4. 18 chests tea, averaging 75 lbs., @ 28c. a lb.
5. 96 boxes soap, averaging 60 lbs., @ 3c. a lb.
6. Find total amount of 5 sales given above.

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7. How many feet in 320 rods and 8 feet?
8. How many rods in 24 miles and 116 rods?
9. How many square feet in 48 sq. yds. and 7 sq. ft.?
10. How many sq. rods in 40 acres and 124 sq. rods?

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11. How many cu. in. in 6 cu. ft. and 196 cu. in.?
12. How many cu. ft. in 47 cu. yds. and 19 cu. ft.?
13. How many cu. ft. in 8 cords and 40 cu. ft.?
14. How many pounds in 4 tons and 1200 pounds?
15. How many hundredweight in 12 tons and 12 cwt.?

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16. In 1 gallon there are 231 cubic inches; how many cubic inches in 8 gallons?
17. How many cubic inches in 1 barrel? ($31\frac{1}{2}$ gal.)
18. How many gallon measures can be filled from a box containing 1728 cubic inches of meal?
19. If a bushel of wheat weighs 60 pounds, and a bushel of corn 56 pounds, how many pounds does a bushel of wheat weigh more than a bushel of corn? What is the difference in weight between 375 bushels of each grain?
20. If a box contains 4 cubic feet, how many gallons (231 cubic inches) does it contain?
21. How many books of 320 pages each, may be made from 24 reams of paper, if 1920 pages can be made from each ream?

1. How many $20 bills make $100? $1000?
2. How many cows at $50 each can be bought for $1000?
3. If it takes 22 yards of silk to make a dress, how many yards in a piece of goods from which 4 dresses can be sold? What is the value at $2 a yard?
4. How many $5 bills are required to pay a debt of $455?
5. A person sold 9 sheep for $65 and thereby gained $11. What did the sheep cost him per head?
6. A boy picking cherries filled a bushel basket and a half bushel measure. How much money was he paid for picking them at 15c. a peck?
7. What are cherries worth at 10c. a quart?
8. How many pies could be made of the cherries if a pint of cherries be used to a pie?
9. What would the pies be worth at 20c. each?
10. I bought a 2 bushel sack full of beans at $2 a bu. What was the cost?
11. What are the beans worth at 50c. a peck?
12. Find the value of the beans at 10c. a quart.
13. I bought 4 boxes of toilet soap at 30c. a box. Find the cost.
14. What is the value of the soap at 12c. a cake, if each box contained three cakes?
15. What cost 2 quarts of beans, at 6c. a pint?

At sight read the following as pecks; also as quarts:

16. 2 bushels, 5 bushels, 10 bushels, $1\frac{1}{2}$ bushels, $2\frac{1}{2}$ bushels.

Read the following as cents; also as mills:

17. $3, $5, $8, $10, $15, $2, $3, $7.

18. $\frac{\$12}{3}$ $\frac{\$24}{4}$ $\frac{\$24}{8}$ $\frac{\$122}{2}$ $\frac{\$328}{8}$

Find the amounts of the following sales:

1. 36 cattle, average weight 1247 lbs., at 4c. a lb.
2. 48 cows, average weight 1010 lbs., at 2½c. a lb.
3. 28 cows, average weight 904 lbs., at 2½c. a lb.
4. 89 cows, average weight 972 lbs., at 3½c. a lb.
5. 95 oxen, average weight 912 lbs., at 3½c. a lb.
6. 88 cattle, average weight 1142 lbs., at 4c. a lb.
7. 97 cattle, average weight 1386 lbs., at 4½c a lb.
8. 47 cattle, average weight 1534 lbs., at 5c. a lb.
9. 18 calves, average weight 152 lbs., at 6c. a lb.
10. 15 calves, average weight 148 lbs , at 6½c a lb.
11. Find the total of the 10 sales given above.

12. 3121 bu. No. 2 white wheat, at 79c. a bu.
13. 383 bu. No. 4 white wheat, at 74c. a bu.
14. 2190 bu. No. 2 long red wheat, at 75c. a bu.
15. 4684 bu. No. 1 Turkish wheat, at 76c. a bu.
16. 63968 bu. No. 2 Turkish wheat, at 77c. a bu
17. 24384 bu. No. 1 red wheat, at 75½c. a bu.
18. 479818 bu. No. 2 red wheat, at 74c. a bu.
19. 89572 bu. No. 3 red wheat, at 73c. a bu.
20. 17530 bu. No. 4 red wheat, at 69c. a bu.
21. 479024 bu. No. 2 spring wheat, at 74c. a bu.
22. Find the total number of bushels, and the value.

23. No. 2 yellow corn, 751917 bu., at 37c. a bu.
24. No. 3 yellow corn, 136343 bu., at 35c. a bu.
25. No. 2 white corn, 209426 bu., at 36c. a bu.
26. No. 2 white oats, 25586 bu., at 29c. a bu.
27. No. 2 mixed oats, 1,022,693 bu., at 27c. a bu.
28. Find the total number of bushels, and the value.

LESSON XCIV.

EXAMINATION—WRITTEN.

1. Add sixty thousand forty, 101 thousand 806, 7 million 7 thousand 7, 723 million, 206 thousand nine hundred 75, 60109, 648382 and 1046.
2. $\frac{3}{7}$ of 447594 = ? $\frac{1}{9}$ of 59265 = ?
3. If $\frac{1}{4}$ of an acre of ground cost \$76, what will 19 acres of the same cost?
4. How much more will 26 horses cost at \$135 each than a farm worth \$2478?
5. What will 2 bushels of potatoes cost, if 1 peck is worth 45 cents?
6. Dividend 86,039,726 divisor 23. Find the quotient.
7. How many pounds in 48992 oz.?
8. How many pts. in 97 pecks?

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9. What will 253 lbs. of butter cost, at $2\frac{1}{2}$ cents an oz.?
10. If a grocery bill is \$83.12$\frac{1}{2}$, how much change should be returned for a \$100 bill given in payment?
11. A man bought 96 gallons of oil. He sells $\frac{1}{8}$ of it for 90 cents a gallon. How much does he get?
12. Find the cost of 960 qts. at 80c. a gallon.
13. Find cost of grading 12 miles of road at \$82 a rod.
14. In an ordinary wagon box are 24 bushels of wheat. What is the value of the wheat at $2\frac{1}{2}$ cents a quart?
15. On one side of a certain street there are 275 trees; on the other side are one fifth as many. How many trees on both sides of the street?
16. By what number must 19 be multiplied to make the product 10982?

FOURTH GRADE.

LESSON I.

NOTATION AND NUMERATION TO ONE BILLION.

1. Write 5 numbers of 5 figures each and read them.
2. Write the smallest number possible with two periods of figures. The largest number possible with two periods of figures.
3. Write and read 5 numbers of 7 figures each. Of 8 figures each. Of 9 figures each.
4. Write the smallest and the largest number possible with three periods of figures.
5. How many orders are required to express a million in figures? To express one hundred millions?
6. Write the following in figures:

   One hundred thousand one hundred.
   Six hundred million sixty thousand.
   Seventy-five million 7 hundred five thousand.
   Nine hundred 99 million 9 hundred ninety nine.

One billion is written 1,000,000,000.

7. Express by figures:

Two billion.	Four billion	Seven billion.
Three billion.	Five billion.	Nine billion.

8. How many units equal one *ten?* How many tens equal one *hundred?* How many hundred equal one *thousand?* How many hundred thousand equal one *million?* How many hundred million equal one *billion?*
9. 500 is how many times 50? How many times 5?

Each digit has a SIMPLE VALUE *and a* LOCAL VALUE. *The simple value of a digit is always the same; thus, in 44, the digit 4 represents four units in units' order, and, also, four units in tens' order. The local value depends upon the order in which a digit stands; 4 in tens' order represents ten times as many units as it represents when placed in units' order.*

1. What value does the digit 5 represent in the number 555?
2. Tell what value each digit represents in 123; in 789; in 2040; in 75,000,600.

The ROMAN NOTATION employs the seven capital letters, I, X, C, M, V, L, D.

I=1. X=10. C=100. M=1000.
V=5. L=50. D=500.

Other values are represented by certain combinations of these letters in accordance with the following

PRINCIPLES.

1. If a letter is repeated, or if a letter or combination of letters of less value follows a letter of greater value, the sum of the values is the value of the combination.

   Thus, III=3. XXX=30. VI=6. DC=600. XIX=19.

2. If a letter of greater value follows a letter of less value, the difference of the two values is the value of the combination.

   Thus, IX=9. XL=40. CD=400.

3. A dash (—) placed over a letter or combination of letters, gives it a thousand-fold value.

   Thus, $\bar{I}$=one thousand. $\overline{XX}$=twenty thousand.

Read the following:

IV, VI, XIX, XXII, XLIX, MDCCCLXXXVII.

MULTIPLICATION OF U. S. MONEY.

1. What is the cost of 45 yards of cloth, at $1.125 a yard?

REMARK: *$1.125 × 45 = $50.625. Place the decimal point to the left of the 6, leaving as many places for cents and mills as there are in the number multiplied.*

2. What is the cost of a load of wheat weighing 2520 lbs., at $0.875 a bushel?
3. A farmer went to the warehouse with two loads of wheat; one load weighed 2580 lbs. and the other 2880 lbs. What did he get for the wheat at 79½c. a bushel?
4. Find the cost of 3 bales of cloth, each containing 28 yds., at $1.375 a yard.
5. A grain dealer bought 3 car loads of wheat, weighing, respectively, 28680, 27960 and 27780 lbs., for which he paid $1.03½ a bushel. What was the cost?

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6. The same dealer sold the two car loads first mentioned in the preceding problem, at $1.04½ a bu. How much money did he receive for them?
7. He sold the other car load at a loss of 1c. a bushel. What did he gain on the 3 car loads?
8. I bought 7 kegs of Congress mineral water, each containing 5 gal., at 12½ cents a gal. Find the cost.
9. Find the cost of 75 lbs. German quince seed, at $1.32½ a lb.
10. What is the cost of 18 lbs. silver nitrate, at $12.37½ a lb.?
11. What is the value of 4 doz. bottles of Cream of Roses, at 78⅓ cents a bottle?
12. Find the value of 4 sugar-cured hams, weighing, respectively, 17, 19, 16 and 22 lbs., at 11⅓ cents a pound?

1. What is $\frac{2}{3}$ of 24? Of 36? Of 27?
2. What is $\frac{3}{4}$ of $32? Of 48 bushels?
3. Find $\frac{2}{5}$ of 40 tons. Of $60?
4. Find $\frac{1}{6}$ of 90? $\frac{2}{6}$ of 90?
5. One half of $50 equals how many $2 bills?
6. What is the cost of 4 yards of cloth, at $2.50 a yard.
7. A dealer bought 10 bunches of bananas at $3 a bunch One fifth of them rotted. What was his loss?
8. 63 gallons equal 1 hogshead. How many gallons in one third of a hogshead?
9. A boat is 43 yards from each shore of a river. How wide is the river?
10. James receives $8 a week for helping his father, and Julia $\frac{3}{4}$ as much. What does she receive? What do both receive in two weeks?
11. A circular lake is 40 rods across it, and the distance around is 3 times as much. How far around it?
12. One pint equals 4 gills. How many pints in 80 gills? In 120 gills?
13. How many inches in a yard stick? How many inches in one eighth of a yard?
14. What is one ninth of $144?
15. If a man can do a piece of work in 6 days, working 12 hours a day, in how many days can he do it working 9 hours a day?
16. If 9 cords of wood cost $36, what will 12 cords cost?
17. If George earns $42 in 7 weeks, how long will it take him to earn $72?
18. Mr. Arthur paid $54 for 9 boxes of oranges. What would a dozen boxes cost at the same rate?
19. How many barrels of flour at $4 a barrel can I get for 10 cords of wood at $5 a cord?

New York, Jan 25, 1887.

Theodore Smith

Bought of N. Y. Carpet Co.

32 pcs. Brussels, 56 yds. each,	@ $3.80	
48 " Wilton, 64 " "	@ 3.25	
50 " Turkey, 63 " "	@ 3.40	

Omaha, Neb., April 1, 1887.

Mr. George Richards

To Hill Bros., Dr.

1887.				
Jan.	1	To 36 yds. Linen,	@ $2.50	
Feb.	1	" 40 " Cambric	@ 0.60	
Mar.	1	" 60 " Silk,	@ 8.00	
"	15	" 24 " Velvet,	@ 16.00	

Rec'd Payment, Hill Bros.

Per Sprague.

1. A certain plant had 3 blossoms the first year. It doubled the number of blossoms each year. How many blossoms had it the third year?
2. I have an album which has 20 leaves, and 4 pictures on a page. How many photographs does it hold?
3. The tower of the Board of Trade building of Chicago is about 300 ft. high. That is equal to the combined height of how many men each 6 ft. tall?
4. If sugar costs 6c. a pound by the barrel and is sold at retail for 8c. a pound, how much is gained on a barrel of 300 lbs.?
5. A man who is three score and ten years old, is 10 times as old as his granddaughter. How old is she?
6. How much will a boy save in a week if he earns 5c. an hour for 8 hours a day and spends 10c. a day?
7. How long will a barrel of flour (196 lbs.) last a family that bakes bread once a week and uses 8 lbs. of flour to a baking?
8. I bought 2 lbs. of maple sugar and gave away 12 oz. How many ounces had I left?
9. A teacher bought a gross of pens and gave 5 pens to each of 9 boys. How many has she left?
10. A quarter section of land is 160 rods on a side. How far around it?
11. A pencil is worth 5c. and an eraser 3c. What is the cost of a dozen of each kind? How much change should I receive if I give a $2 bill in payment?
12. I bought a hat for $3.50 and a tie for 75c. How much change should I receive for a $5 given in payment?
13. A man paid $132 for 11 tons of hay. What should he charge his neighbor who buys a $\frac{1}{2}$ ton of him?
14. $2 less the cost of 3 pks. of peas at 20c. a pk?

Find the amounts of the following:

lb. = pound, @ = at.

1887.			$	¢
Jan	5	1 lb. raisins, @ 13¢ a lb.		
"	8	1 lb. layer figs, @ 24¢ a lb.		
"	8	1 lb. currants, @ 12¢ a lb.		
		Amount		
Feb.	7	1 can peaches, @ 18¢ a can		
"	7	1 can plums, @ 22¢ a can		
"	7	1 can figs, @ 38½¢ a can		
"	7	1 can cherries, @ 11¢ a can		
"	7	1 can apples, @ 23¢ a can		
		Amount		
Mar.	12	1 barrel flour, @ $5 a bbl.		
"	18	1 sack flour, @ $2 a sack		
		Amount		

Grocer's Order Book, May 4, 1887

Mrs. J. Smith, 15 Fremont St.

1 lb. Y. H. tea, @ 48¢ .....

1 bu. potatoes, @ 65¢ .....

1 doz. eggs, @ 23¢ .....

1 lb. dairy butter, @ 26¢ .....

Amount .....

Mr. A. Davis, 71 St. Paul St

1 lb. raisins, @ 14¢ .....

1 pail lard, @ 70¢ .....

1 bu. apples, @ 75¢ .....

1 peck turnips, @ 35¢ .....

1 gal. kerosene, @ 14¢ .....

Amount .....

St. Louis, June 1, 1887.

Mrs. James Shields

Bought of Mills & Brown,

1887.				
Apr.	15	24 yds. Cloth,	@ $3.80	
"	25	13 " Velvet,	@ 9.00	
May	10	36 " Silk,	@ 4.50	
"	25	27 " Cassimere	@ 2.75	

Madison, Wis., June 25, 1887.

Messrs. Paul, Everett & Co.

To Wm. Nelson, Dr.

1887.				
Jan.	10	To 236 bu. Wheat,	@ $1.20	
"	18	" 190 bu. Corn,	@ 0.90	
Feb.	5	" 125 bbls. Flour,	@ 7.80	
"	13	" 86 sacks Potatoes	@ 1.85	

Rec'd Payment, Wm. Nelson.

1. If 9 barrels of flour cost $45, what does 1 barrel cost? What is the cost of 7 barrels, at the same rate?
2. If 3 pounds of butter cost 75 cents, what is the cost of 1 pound? Of 4 pounds?
3. Find the cost of 7 acres of land, at the rate of 5 acres for $250.
4. I earned $42 in 7 weeks. In how many weeks can I earn $54, at the same rate?
5. I earned $63 in 9 weeks. How many dollars would I earn in 12 weeks, at the same rate?
6. A dozen pairs of boots cost $36. What is the cost of 8 such pairs?
7. How many barrels of flour, at $6 a barrel, can be purchased for 4 times $9?
8. What is the value of a dozen chairs, if $\frac{1}{4}$ of a dozen is worth $12?
9. If 1 man can cut 2 cords of wood in 1 day, how many cords can he cut in 5 days? How many cords can 6 men cut in 5 days?
10. If I sell $\frac{4}{5}$ of my 180 books, how many do I sell?
11. If 8 men can build a boat in 6 days, in how many days could 12 men build it?
12. How much cloth, at $3 a yard, can I buy for $\frac{1}{5}$ of $60?
13. I have $96, and lose $\frac{1}{8}$ of it, and find $25; how much do I then have?
14. My hat cost $4, and my coat 6 times as much; how much do both cost?

Find the amount under each account; find, also, the amount of the five accounts:

1. PRODUCE.

546 lbs. creamery butter, at 26c. a lb. - - $..... .....
743 lbs. dairy butter, at 19c. a lb. - - .....
336 lbs. cream cheese, at 14½c. a lb. - - .....
88 doz. fresh laid eggs, at 23c. a doz. - .....

2. GREEN FRUITS.

25 boxes Messina lemons, at $3.55 a box, - $.....
18 boxes Mexico oranges, at $5.50 a box, - .....
63 bbls. Malaga grapes, at $6.45 a bbl. - - .....
84 bunches bananas, at $2.75 a bunch, - .....

3. FLOUR AND FEED.

356 bbls. patent flour, at $4.60 a bbl. - - $.....
678 bbls. bakers' flour, at $3.70 a bbl. - .....
952 bags bran, at 85c. a bag, - - - - .....
446 bags corn meal, at $1.36 a bag, - - .....

4. BOOTS AND SHOES.

48 pairs kip boots, at $2.85 a pair, - - $.....
165 pairs calf shoes, at $3.30 a pair, - - .....
185 pairs kid shoes, at $2.95 a pair, - - .....
230 pairs slippers, at $1.25 a pair. - - .....

5. GRAIN.

3675 bu. winter wheat, at 93c. a bu. - - $.....
5400 bu. spring wheat, at 87c. a bu. - - .....
6548 bu. corn, at 38½c. a bu. - - - - .....
7777 bu. oats, at 28c. a bu. - - - .....

1. I bought a dozen pencils for 36 cents, and sold them at 5 cents apiece; how much did I gain?
2. I bought a gross of screws for 72 cents, and sold them at 8 cents a dozen; how much did I gain?
3. If a boy reads 60 pages a day, in how days can he read 5 volumes of 120 pages each?
4. If a grocer buys butter for 20 cents a pound, and sells it for 25 cents a pound, what is his gain on 150 pounds?
5. A "section" of land contains 640 acres; how many acres in $\frac{1}{4}$ of a half section?
6. How many inches in 8 feet and 6 inches?
7. How many pecks in 5 bushels and 3 pecks?
8. What is the cost of 6 quarts of vinegar, at 3 cents a pint?
9. What is the cost of 16 quarts of syrup, at 60 cents a gallon?
10. If my salary is \$80 a month, and my expenses \$70, how much can I save in 1 year?
11. If I have \$40, and pay a debt of \$18, and another of \$15, how much have I left?
12. John had 720 marbles, and lost $\frac{5}{8}$ of them; how many did he lose?
13. If my wheat crop is worth \$480, what is $\frac{5}{8}$ of it worth?
14. If Mary reads 28 pages every day, and Jane reads 35 pages every day; how many pages does Jane read more than Mary in a month of 30 days?

FREEPORT, ILL., March 31, 1887.

1. MR. A. WOODSIDE

1887. *To* BURRILL BROS. *Dr.*

March 1.	To Statement rendered, - - - -	$18	56
" 5.	" 12½ lbs. granulated sugar @ 8c., -		
" 5.	" 10 " Java coffee @ 30c., - -		
" 12.	" 5 " cheese @ 16c., - - -		
" 26.	" 1 gal. N. O. molasses, - - -		65
		$	
	Cr.		
March 5.	By 27 lbs. butter @ 27c., - - -		
" 5.	" 13 doz. eggs @ 25c., - - -		
" 26.	" 8 bu. potatoes @ 75c., - - -		
		$	

Rule paper properly and make bills for the following and receipt as clerk for the parties:

2. Mrs. A. R. Dixon bought of Chas. H. Smith, of Chicago, Feb. 24, 1887, 3 qts. preserved apricots @ $1.20, 5 qts. blackberries @ 95c., 4 qts. peaches @ $1.10, 8 qts. pineapples @ 60c.; Feb. 28, 3 pts. quinces @ 60c., 4 gal. pears @ $1.70, 2 doz. Florida oranges @ 50c.

3. Henry Goodyear bo't of Pillsbury & Co., Minneapolis, Minn., March 5, 1887, flour: 15 bbls. Pillsbury's Best @ $5.35, 12 bbls. winter wheat @ $5.25, 18 bbls. Extra @ $4.50. Payment by note at 30 days.

4. Mr. Longford bought of Hemshell & Co., Ottawa, Ill., March 8, 1887, 2 lbs. veal @ 16c., 3 lbs. sirloin steak @ 15c., 2½ lbs. ham @ 12c., 2¼ lbs. mutton chops @ 12c.; March 19, 5 lbs. pork chops @ 11c., 3 lbs. tenderloin @ 13c. Mr. Longford sold Hemshell & Co., 2 qts. of milk @ 5c. a qt. daily through the month of March.

ADDITION.

ADDITION in arithmetic is a process of uniting two or more numbers of the same kind into one number, called the *sum* or *amount.*

Helps in *testing* the accuracy of the work in addition:

1. Add the columns from the top downward, or in the opposite direction in which they were added at first.
2. If the columns are long, divide them into two or more parts, add each part and then the several sums.
3. Add each column separately and write the results as shown by 2d addition of example 1, on the opposite page.

---

1. A man sold in three weeks, respectively, 30, 37, and 33 barrels of flour. What did his sales amount to in three weeks at $5 a barrel?
2. A lady bought a shawl for $22, a muff for $12, and a silk dress for $48. Find the entire cost.
3. Spent $46 for butter and one half as much for eggs. What did I spend?
4. A horse cost $90 and a sleigh two thirds as much. What did both cost?
5. I paid ten $5 bills for a cow and fifteen $5 bills for a horse. Find the cost of both.
6. I bought a lot for $500, and built a house that cost me four times as much. What did both cost?
7. What is the cost of a pound of tea at 45c., 6 bars of soap for 25c. and a pound of cheese for 16c.? What change should I receive for $1 given in payment?
8. What is the cost of a cow worth $57, a horse worth $125, and a sleigh valued at $85?

1st Addition.	2d Addition.
34355	30
63259	32
44486	23
78654	26
57896	25
278650	278650

Add the following columns and test the work:

1.	*2.*	*3.*	*4.*
$5.62	$23.18	$126.84	$3278.56
2.28	42.65	769.38	8764.37
7.64	87.39	642.57	3967.48
9.28	56.85	387.42	5673.32
8.49	97.47	896.38	8998.87
$	$	$	$

5.	*6.*	*7.*	*8.*
$5.13	$47.23	$150.38	$3764.05
2.08	84.69	304.05	6430.40
7.65	63.01	760.60	5463.87
9.48	14.50	279.82	5638.76
12.01	18.75	683.27	2673.45
3.98	43.64	764.76	9786.00
7.36	89.18	127.39	7642.19
4.56	43.67	856.43	8967.38
8.93	75.75	637.85	4638.75
6.21	83.32	986.21	3846.28
8.72	76.38	107.17	2118.15
15.37	99.95	908.09	5886.66
6.85	58.84	456.78	3473.28
$	$	$	$

1. A farmer sold 10 lbs. of butter at one time, 12 lbs. at another, and 3 lbs. at another. What did he get for the butter at 20 cents a pound?
2. What is the cost of 3 lbs. of meat at 12 cents a pound and 2 lbs. of sausage at 10 cents a pound?
3. There are now (1887) 38 States in the Union and 11 Territories. How many political divisions in all?
4. On an excursion steamer were 55 passengers on one trip and 60 on another. How many on both trips?
5. Harry and James have a patch of ground in their father's garden. On this patch Harry raised 3 dozen melons and James 4 dozen. How many melons did both boys raise?
6. Mr. Bradley has two houses which he rents; for one he receives $25 rent and for the other $35, a month. What is his income from this source a month? What in 6 months? What in one year?

Write examples from the following and make the proper change:

7. Having $1, buy some coffee and some sugar.
8. Having $1, buy some tea and some raisins.
9. Having $1, buy some steak and some ham.
10. Having $2, buy enough calico for a dress.
11. Having $5, buy a pair of shoes.
12. Having $1, buy some green fruit for the table at dinner.
13. Having $2, buy some coffee, some sugar and some butter.
14. Having $1, buy some milk tickets.
15. Having $10, buy some coal or wood.
16. Having $5, buy the books you need for this grade.
17. Having $15, buy a suit of clothes.
18. Having $5, buy some oysters and crackers for dinner.

Make out bills in proper form from the following:

1. Feb. 23, 1887, Dilly Brothers bought of Geo. Simpson & Co., Chicago, 15 doz. Model El. Arithmetic, @ $5.40; 3 doz. Model Arith. comp., at $7.80; 1 doz. Taylor's Model History, at $9.60; 24 doz. Writing Spellers, at 45c.; 8 Martin's Record, @ $1.10.

2. A. D. Watkins & Co. bought of C. Jones & Co., Chicago:
   14 bales Mocha Coffee, 35 lbs. each, @ 26c.
   9 mats No. 1 Java Coffee, 68 lbs. each, @ 27c.
   8 mats No. 4 Java Coffee, 65 lbs. each, @ 23c.
   5 sacks Golden Rio Coffee, 135 lbs. each, @ 17c.

3. C. H. Duth bought of R. Bartlett & Co., Battle Creek, Mich.:
   3 doz. Novelty Wash-boards, @ $2.50.
   7 doz. Eagle Wash-boards, @ $1.85.
   3 doz. Heavy Hoop Tubs, @ $8.75.
   4 doz. No. 3 Wood Scoops, @ $4.50.
   3 M. Paper Bags, @ $1.72.
   5 doz. Baskets, @ $2.48.
   3 doz. No. 1 Trays, @ $4.85.
   15 gro. Swedish Matches, @ $2.75.

4. Mr. Mark bought of Larkin & Meyer, Buffalo, N. Y.:
   2 doz. N. C. Wringers, @ $42.50.
   7 doz. Wooden Tubs, @ $8.25.
   4 doz. Bushel Baskets, @ $7.75.
   5 doz. Wood Shovels, @ $6.85.
   3 Oil Tanks, @ $15.50.
   5 doz. Horse Brushes, @ $5.90.
   6 Broom Racks, @ $2.50.

SUBTRACTION.*

PROOF: *The* MINUEND *is equal to the sum of the subtrahend and remainder, therefore add the* REMAINDER *to the* SUBTRAHEND, *and if the work is correct the sum is equal to the minuend.*

The remainder is sometimes called the difference.

1. A merchant sold for $101 what cost him $88. What was his profit?
2. What number must be added to 124 to equal 140? To equal 151?
3. Bought a handkerchief for 22c., and some elastic for 12c., and gave in payment a 50c. piece. Find the change I should receive.
4. Harry is standing on the middle round of a ladder. If he is standing on the 17th, how many rounds has the ladder?
5. One room of a house requires 27 yards of carpet, another room 30. How many yards does the third room require if the three rooms require 89 yards?
6. A room measured with a yard stick is found to be $5\frac{1}{3}$ times the length of the yard stick. How many feet long is the room? How much longer is another room that is 7 yards long?
7. From a roll of wall-paper 48 feet long, three strips, each 8 feet long, have been cut off. How many feet are left in the roll?
8. A lady bought a cooking range for $55, and an oil stove for one eleventh as much. What is the difference in the price of the two articles? What is the sum?

*Review page 141 if necessary.

1.	*2.*	*3.*	*4.*	*5.*	*6.*
573	758	835	968	839	548
248	375	583	675	584	394
7.	*8.*	*9.*	*10.*	*11.*	*12.*
8672	5384	8275	2743	6735	7219
3738	2537	2937	1245	5376	1972

Find the omitted term.

13. $35672 - 23828 = ?$
14. $? = \$3865 + \$2376.$
15. $53413 - ? = 28401.$
16. $\$5240 - ? = \$1786.$
17. $? = 1887 \text{ yrs.} + 4004 \text{ yrs.}$
18. $1900 \text{ qts.} - 999 \text{ qts.} = ?$
19. What number must be added to 32678 to make the sum equal to 54375.

Find the time since the dates of the following events:

20. Discovery of America, in 1492, A. D.
21. Landing of the Pilgrim Fathers, in 1620.
22. Beginning of Queen Victoria's reign, 1837.
23. Birth of Queen Victoria, in 1819.
24. First newspaper in America, in 1704.
25. Founding of Rome in 753 B. C. (Before Christ).

REMARK: *To find the time from any event, which occurred before the birth of Christ, to the present, add the years B. C. to those of A. D.*

26. Building of the Temple at Jerusalem, by Solomon, in 1012 B. C.
27. Introduction of glass into England, in 676.
28. Manufacture of carpets in England, in 1750.
29. Invention of modern printing, by John Guttenberg, in 1444.

1. I have 3 yards of lead pipe, worth $0.50 a foot. Find the value.
2. A certain lead pipe weighs 3 lbs. to the foot. How many pounds do 25 ft. of it weigh?
3. A room is 14 ft. wide. How many strips of carpet a yard wide are required to cover it?
4. A carpenter is building a coal shed, of which the roof on one side from the eaves to the ridge is 10 ft. If each layer of shingles covers 5 inches, how many layers will cover one side?
5. A mason is building a chimney which requires 500 bricks; he has laid 240 bricks. How many more has he to lay?
6. A grocer shipped 6 dozen eggs; $1\frac{1}{2}$ dozen were broken. How many were not broken?
7. How many yards of calico, at $0.10 a yard, can be bought for $1?
8. At 5 cents a yard, how many yards of ribbon can be bought for $0.75?
9. At 2 cents each, what is the postage on 14 letters?
10. If you gave a 50-cent piece in payment for the stamps, how much change should you receive?
11. I have $2.50 and spend $2.35. How much of my money is left?
12. A village has 78 street lamps. The lamp-lighter has lit 35 of them. How many are not lit?
13. A house has 15 windows of four panes of glass each. The glazier has put the glass into 7 of the windows. How many panes remain to be set?
14. The public debt of the United States, on the first day of July, 1860, was $64,842,287; July 1st, 1866, it was $2,773,236,173. How much had it increased in six years? (*Solve with the pencil.*)

The following arrangement, where there are several parts to the subtrahend, occurs frequently in business. Add the numbers of the subtrahend and write the result on line with the lowest number of the subtrahend.

1.	$	¢	$	¢
Minuend—Deposited in bank -			8765	30
Subtrahend { Check (drew out)	1653	50		
Subtrahend { Check (drew out) -	245	84		
Subtrahend { Check (drew out)	84	37	1983	71
Remainder in bank - -			6781	59
2.				
Deposited in bank - - -			4786	92
Drew out by check - -	2138			
Drew out by check - - -	876	45		
Drew out by check - -	287	28		
Balance in the bank - -				
3.				
I sold a farm for - - -			9875	
Invested in bonds - -	2150			
Bought a house - - -	2450			
Spent for repairs - -	739	78		
How much is left? - -				
4.				
Three men possess - - -			7268	58
One day they spend - -	1765	25		
Another day they spend -	3628	45		
How much have they left?				

MULTIPLICATION.

PROOF: *Divide the product by either factor (by the multiplicand or the multiplier); the quotient is the other factor; thus 15 is the product of the factors 3 and 5; if 15 is divided by 3 the quotient is 5, the other factor; or, if 15 is divided by 5, the quotient is 3.*

1. What is the value of 7 sheep, at $9 a head? Of 12 sheep at $7 a head? Of 15 sheep at $4 a head?
2. Find the cost of 3 lbs. of butter at 20c. a pound.
3. Find the cost of 12 pencils at 4c. apiece.
4. I have 35 cents in 5-cent pieces. How many pieces have I?
5. I bought $\frac{2}{3}$ of a dozen of oranges at 4 cents apiece. What was the cost?
6. How many pints in a $\frac{1}{4}$ gallon? In $\frac{1}{2}$ gallon?
7. How many quarts does a five-gallon can hold?
8. Four pecks are how many quarts?
9. Two pecks and 5 quarts are how many quarts?
10. When 3 apples are worth one peach, how many apples can I get for 15 peaches?
11. If 6 peaches fill a quart-measure, how many will fill a half bushel?
12. How much change should I receive if I give $1 in payment for 7 yards of calico at 9 cents a yard?
13. George sold 9 hens at 40 cents apiece. How much money did he receive for the hens?
14. How many inches tall is a man who measures 5 ft. 11 in.?
15. What is the cost of a bushel of potatoes, at 50c. a peck?
16. How many gallons of oil in 80 bbls., each holding 50 gals.?
17. An 8-gallon keg will hold how many quarts?
18. How many hours in 2 days 15 hours?

Find the product in each of the following examples:

1. Fifteen carriages at $175 each?
2. Forty acres of land at $56 an acre?
3. Twenty-eight days' work at $3.25 a day.
4. Eighty-six barrels of flour at $4.75 a barrel.
5. 245 horses at $145 each.
6. 485 cows at $47.50 each.
7. 118 tons of coal at $6.85 a ton.
8. 825 barrels of flour of 196 lbs. each.
9. 1250 sacks of wheat, each weighing 165 lbs.
10. 2575 bushels of wheat at 60 pounds to the bu.

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11. A salary of $1250 a year for 18 years.
12. 45 houses, each valued at $4350.
13. 325 thousand brick at $9.75 a thousand.
14. 678 cattle, average weight 1348 lbs. @ 4½c. a lb.
15. 3225 hogs, average weight 395 lbs., @ 5c. a lb.
16. 956 heads of cabbage at 6½c. a head.
17. 584 pairs of boots at $4.35 a pair.
18. 476 barrels of pork at $11.75 a barrel.
19. 1575 men, average weight 158 lbs.

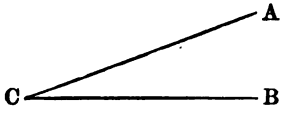
---

20. 486 passengers, at a fare of $23.75.
21. 320 acres of land at $168.75 an acre.
22. 1345 pieces of cloth of 48 yds. each, at $2.65 a yd.
23. 3468 bu. of potatoes at $0.78 a bushel.
24. How many days in 79 years of 365 days each?
25. How many gallons in 384 bbls. of 31½ gal. each?
26. If you count 120 a minute for 10 hours each day, how many can you count in 14 days?

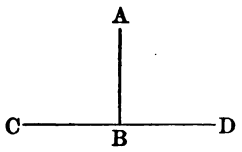
24 sheets = 1 quire.	1 quire = 24 sheets.
20 quires = 1 ream.	1 ream = 20 quires.

1. How many sheets in 2 quires? In 4 quires?
2. How many sheets in $\frac{1}{2}$ quire? In $\frac{3}{4}$ quire?
3. How many quires in 72 sheets? In 240 sheets?
4. How many quires in 3 reams? In 5 reams?
5. How many quires in 30 reams? In 60 reams?
6. How many sheets in 1 ream? In $\frac{1}{2}$ ream?
7. How many quires in $\frac{1}{2}$ ream? How many sheets in $\frac{1}{4}$ ream?
8. What is the cost of a quire of paper at 2c. a sheet?
9. At 1 cent a sheet, what is the cost of a ream?
10. Find the cost of a ream at one half cent a sheet; at a quarter cent a sheet.
11. Four boys together bought a ream and divided it equally among them. How many sheets was each one's share?
12. What is the cost of a ream, if 24 sheets are sold for 5c?
13. What part of a quire are 6 sheets? 4 sheets?
14. What part of a ream is one quire? 2 quires?
15. If a sheet is folded so as to make four pages, how many pages will one quire make?
16. I paid $2.40 for a ream of paper. What is the cost per sheet?
17. When a sheet is folded in two leaves, it is called a *folio*. How many folios will one quire make?
18. A ream makes how many *folios*?
19. When a sheet is folded into 4 leaves, it is called a *quarto*. How many pages in one quarto? How many *quartos* will one quire make?
20. An *octavo* is a sheet folded into 8 leaves. How many pages in 4 *octavos*?

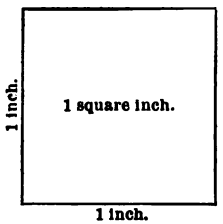
1. How far can a man travel in 6 days and nights, if he goes at the rate of 25 miles an hour?
2. Find the cost of 28 loads of hay, at $13.50 a load. How would this example be solved by addition? Which does this problem ask for, 13.50 times 28 loads, or 28 times $13.50? Which number should be the multiplier? Which should be the number multiplied? Is the product loads or dollars? Is it like the multiplicand or like the multiplier?
3. The circumference of the earth is 25000 miles. How many rods is it?
4. If Adam had received a salary of $25000 a year since 4004 B. C., how much would he have received up to 1887? How much less is this sum than two hundred millions of dollars?
5. A passenger coach costs $5250, a dining coach $11200, a Pullman sleeping coach $14500, and a baggage car $1800. Find the cost of a train consisting of 3 baggage cars, 5 passenger coaches, 2 dining coaches and 4 sleeping coaches.
6. The cost of an ordinary freight car is $450, and a cattle car $425. What is the value of the cars of a train consisting of 27 freight cars and 14 cattle cars?
7. What is the weight of a car loaded with 14 tons of coal, if the car weighs 21375 lbs.?
8. What is the weight of a car containing 64 passengers, averaging 138 lbs., the car weighing 28195 lbs.?
9. If it requires 1576 pickets to fence one side of a square lot, how many pickets will be required to fence 18 such lots?
10. What is the cost of these fences, if the material for each lot costs $165 and the labor $350?



The angle A C B is formed by the meeting of the lines A C and B C at the point C.



The line A B meets the line C D so as to make the angles A B C and A B D equal. Such angles are *right angles*. A right angle is sometimes called a "square corner."



1. Draw a square exactly 2 inches on each side and divide it into square inches. How many square inches does it contain?
2. Draw a square 4 inches on each side and divide it into square inches. How many square inches does it contain?
3. Draw a square exactly 12 inches on a side. Divide it into square inches. How many square inches in one row? In 12 rows? How many square inches in 1 square foot?
4. To square a number is to multiply it by itself; the square of $2 = 2 \times 2$ or 4. What is the square of 3?
5. Square the numbers 4, 5, 6, 7, 8, 9, 10, 11, 12.
6. Draw a square 1 yard on each side and find how many square feet it contains.
7. Draw a square $5\frac{1}{2}$ inches on each side. Draw straight lines dividing it into 25 square inches, 10 rectangles each one half of a square inch, and one quarter of a square inch. How many square inches in the square? If the square were $5\frac{1}{2}$ yards on each side, how many *square yards*?

TABLE OF SQUARE MEASURE.

144	square inches (sq. in.)	=	1 square foot (sq. ft.)
9	square feet -	=	1 square yard (sq. yd.)
$30\frac{1}{4}$	square yards -	=	1 square rod (sq. rd.)
160	square rods -	=	1 acre (A.)
640	acres - -	=	1 square mile (sq. m.)

1. Draw a square, 12 inches on each side. Divide it into square inches.
2. Draw another square one foot on each side. Draw one line through the middle of the square? How long is each half? How wide? You have two *rectangles.* How many and which sides are equal? Now divide one of the rectangles into square inches. How many square inches have you? How many dimensions has a rectangle?

   REMARK: *72 square inches is the area of the rectangle, which is 12 in. long and 6 in. wide.*

3. What is the area of the top of your desk? Of the door? Of a window? Of the floor of his room? Of one of the blackboards?
4. How many square rods in 4 acres?
5. How many acres in $\frac{1}{4}$ of a square mile?
6. Why are there $30\frac{1}{4}$ square yards in a square rod?
7. How many sq. in. in 12 square feet?
8. Show how many inches in the square of $\frac{1}{2}$ of a foot?
9. A man having a field containing one square mile of land, sold one fifth of it. How many acres had he left?
10. Find the area of this school yard.
11. Find the area of the walk in front of the school-yard?
12. How many rods around 1 sq. mile of land?

A PRACTICAL METHOD OF MULTIPLICATION.

I. When the Unit Figure of the Multiplier is 1.

1. Find the product of 5678 and 41.

5678 × 41 = 23798.
22712
232798

Remark: *Find the product of 5678 by 4 and place it under the number to be multiplied, and then add the two. (Multiply as usual and see how the products stand.)*

Find the product of

2. 387569 and 21.
3. $787.54 and 71
4. $5679 and 421.
5. 8465 and 501.
6. 7463 and 801.
7. 3672 and 531.

II. When the Multiplier is 12, 13, Etc., or 123, 145, Etc.

8. 5473 × 15 = 81955.
27225
81955

Remark: *Find the product of 5473 and 5 and write it under the number to be multiplied as shown in the margin.*

9. 6537 × 137 = 895569.
19611
45759
895569

10. 57687 × 13.
11. 84369 × 125.
12. 49654 × 106.
13. 76598 × 118.

III. When the Multiplier is 11, 111, Etc.

14. 47673 × 11 = 524403.
524403

Remark: *Here the product is found by addition. Draw a line under the number to be multiplied, then bring down 3, the unit figure. 3 + 7 = 10. (Write 0 and add 1 to the next). 1 + 7 + 6 = 14. 1 + 6 + 7 = 14. 1 + 7 + 4 = 12. 1 + 4 = 5.*

15. 32465×11.
16. 44673×111.

DIVISION.

1. Show by subtraction how many 25's in 125. Find the result by division.
2. 125−25−25−25−25=?
   125÷25=?
3. 175−35−35−35−35−35=? Can you find the result by the process of division? Why? When may the process of division be used instead of subtraction?

4. Divide 6323 by 26; by 27; by 28; by 29.
5. Divide 8769 by 31; by 32; by 33; by 34.
6. Divide 589676 by 35; by 36; by 37; by 38.

The numbers used in division are called *Dividend, Divisor* and *Quotient.* They are often called the *terms* of division.

Divisor × Quotient = Dividend.

Dividend ÷ Divisor = Quotient.

Dividend ÷ Quotient = Divisor.

When there is a remainder it is an undivided part of the dividend.

PROOF: *The Dividend is the product of the Quotient and Divisor. When there is a remainder it must be added to this product to equal the dividend.*

Find the quotients and remainders:

1. 3767 ÷ 38.
2. 4398 ÷ 39.
3. 7873 ÷ 41.
4. 9542 ÷ 42.
5. 6598 ÷ 44.
6. 59674 ÷ 45.
7. 37492 ÷ 46.
8. 76381 ÷ 47.
9. 89374 ÷ 48.
10. 96573 ÷ 49.
11. 67654 ÷ 53.
12. 26754 ÷ 64.
13. 95637 ÷ 75.
14. 76894 ÷ 86.
15. 99765 ÷ 99.

1. If $\frac{1}{2}$ lb. of raisins cost 11 cents, find the cost of 2 lbs. Of 12 lbs.
2. A half pound of French prunes is worth 12 cents. What is the cost of $\frac{1}{3}$ pound?
3. $\frac{1}{3}$ dozen eggs cost how much, at the rate of 15 cents for a half dozen?
4. If $5 is one fifth of a man's money, what is one fourth of it?
5. Mr. Hervey bought a suit of clothes. He paid $15, or one half of it when he ordered it, and one third of it when he got the suit. How much has he paid? How much does he still owe?
6. What is $\frac{1}{6}$ of my age, if $\frac{1}{8}$ of it is 12 years?
7. How much rent do I pay a year, if $\frac{1}{7}$ of a month's rent is $2?
8. If $\frac{1}{4}$ of an acre is worth $40, what is $\frac{1}{5}$ of it worth?
9. Of a military company 8 men were killed, which was $\frac{1}{9}$ of the company, and $\frac{1}{8}$ of the men were wounded. Find the number wounded.
10. What is $\frac{1}{8}$ of a flag-pole, if $\frac{1}{12}$ of it is 12 ft.?
11. What is one twelfth of my debt, if $\frac{1}{9}$ is $12?
12. One fourth of the cost of my house lot is $500; I owe $\frac{1}{5}$ of the cost yet. How much do I owe?
13. Mr. Adam's salary is $2700; one third of his salary is equal to one half of mine. What is my salary?
14. I receive $1800 a year; one ninth of it is equal to $\frac{1}{6}$ of my expenses. What are my expenses? How much can I save in 6 years?
15. $40 is equal to $\frac{1}{6}$ of my house rent for one year. How much a month do I pay?
16. $\frac{1}{5}$ of my house rent is equal to $50. My rent is equal to $\frac{1}{8}$ of my income. What is my income?

SHORTER METHOD IN LONG DIVISION.

1 Find how many times 34 in 8379.

8379÷34=246.
157
219
15. Rem.

REMARK: *By this method the written products are omitted. The remainders are obtained by addition.* (*See page 151.*) *Thus, 2 times 4 are 8, and 5 added to 8 are 13. Write 5 as indicated and carry 1. 2 times 3 and 1 are 7. 7 + (1) = 8. Write 1. Annexing the next figure, we have 157 for the second partial dividend. 4 times 4 + (1) = 17. 4 times 3 + 1 (carried) = 13. 13 + (2) = 15. Annex 9. 6 times 4 + (5) = 29.* (*Carry 2.*) *6 times 3 + 2 + (1) = 21.*

2. 24344 ÷ 34.
3. 90888 ÷ 28.
4. 231390 ÷ 45.
5. 219648 ÷ 64.
6. 52767 ÷ 123.
7. 39385 ÷ 271.
8. 18768 ÷ 258.
9. 49879 ÷ 567.

10 Reduce 101 pints, dry measure, to integers of higher denominations.

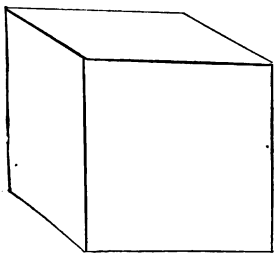
REMARK: *101 pts.÷2=50 qts. 1 pt.; 50 qts.÷8=6 pks. 2 qts.; 6 pks.÷4=1 bu. 2 pks. Therefore 101 pts.=1 bu. 2 pks. 2 qts. 1 pt.*

11. How many feet in 720 inches?
12. Reduce 1280 rods to miles.
13. Reduce 3729 sq. in. to sq. yds.
14. Reduce 9200 sq. rods to acres.
15. Reduce 6400 gills to gallons.
16. Reduce 1200 pints to bushels.
17. Reduce 18246 oz. avoir. to integers of higher denom.
18. Reduce 3000 grs. Troy to integers of higher denom.

TABLE OF CUBIC MEASURE.

1728 cubic inches (cu. in.) = 1 cubic foot.
27 cubic feet (cu. ft.) = 1 cubic yard (cu. yd.)
128 cubic feet = 1 cord (cd.)

1. How long is a chalk box? How wide? How high? How many dimensions has a box? How many *faces* or sides has it? How many *edges?*



A cubic inch is a solid, 1 inch long, 1 inch wide, 1 inch thick. It has six surfaces, each 1 inch square. It has twelve *edges*, each 1 inch long. Draw such a cube.

2. How many one inch cubes can be laid together, side by side, on a square foot of surface? How many can be put in two such layers? How many such layers equal one foot in height? How many cubic inches, then, in a cubic foot?
3. Give the dimensions in feet of a cubic yard.
4. How many blocks 1 ft. long, 1 ft. high, and 1 ft. wide, placed side by side, equal a solid 1 yd. long, 1 yd. wide, and 1 ft. high? How many in two layers or courses? How many layers equal one yard in height? Then, how many cu. ft. in a cu. yd.?
5. How many cubic feet in $\frac{1}{3}$ of a cu. yd.? In $\frac{2}{3}$ of a cu. yd.?
6. How many cu. in. in $\frac{1}{1\frac{1}{2}}$ of a cubic foot? In $\frac{1}{4}$ of a cubic foot? In $\frac{1}{2}$ of a cubic foot?
7. I have a box 8 in. long, 6 in. wide and 5 in. high. How many cu. in. in the box?

1. A man organized a company, with a capital of $30000, to conduct a cattle ranch. Reserving $4500 for expenses, how many cattle, at an average of $12 per head, can they buy for the balance?
2. How many ordinary years in 27655 days?
3. The cost of 272 railway coaches was $1,323,280. What was the average price?
4. If $15275 be equally distributed among 165 persons, what number of dollars will each receive?
5. In 1884, the milch cows of Illinois were valued at $32,269,125 being an average of $35 per cow. How many cows were there?

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6. The cattle received at the Stock Yards in Chicago in 1884 numbered 1,870,038 head. If 18 head were loaded into a car, how many cars would contain them?
7. How long would a train of cars be, if each car takes up 33 feet on the track?
8. How many miles in the length of this train? How many feet remainder?
9. How does the length of this train compare with the greatest length of the State of Illinois, which is 378 miles?
10. One fifth of A's property is $1500, one eighth of B's is $945 and one twelfth of C's is $725. What is one fifteenth of all their property?
11. How many horses can be bought for $65,274, if the average price per horse be $138? What must they be sold for per head to gain $4257?
12. I built 8 houses, at an average cost of $2348, I sold them so as to gain $3944. What was the average selling price?

1. A cord of wood is piled up 8 ft. long, 4 ft. wide and 4 ft. high. How many cubic feet in such a pile of wood? How many in one half as long?
2. How many cu. ft. in 2 cd.? In 10 cd.?
3. How many cu. ft. in a *cord foot* which is 4 ft. wide, 4 ft. high and 1 ft. long?
4. How many cord feet in a cord? In 2 cords?
5. A solid 6 ft. long and 5 ft. wide contains 240 cu. ft. How high, or thick is it?
6. Fred shoveled the snow from their sidewalk. The walk is 100 ft. long and 6 ft. wide and the snow was 1 ft. deep. How many cu. ft. of snow did he shovel off?

   REMARK: *6 ft. long and 3 ft. wide may also be written 6 ft. × 3 ft. The sign × is here read* BY. *6 ft. long, 3 ft. wide and 2 ft. thick may also be written 6 ft. × 3 ft. × 2 ft.*

7. How many sq. in. in a pane of glass 14 in. × 10 in.?
8. How many cu. ft. in a solid 10 ft. × 7 ft. × 7 ft.?
9. 40 ft. × 20 ft. equals what?
10. 100 ft. × 4 ft. × 2 ft. equal what?
11. An excavation for a cellar is 10 yds. × 8 yds. × 2 yds. How many cu. yds. of earth was taken out?
12. What was the cost to excavate the cellar at 10 cents a cu. yd.?
13. How much more than a cord in a pile of wood 10 ft. × 5 ft. × 4 ft.?
14. At 2 cents a sq. ft., what will it cost to paint a bulletin-board 16 ft. × 10 ft.?
15. How many cu. ft. in a cistern 10 ft. × 8 ft. × 7 ft.?
16. John has 5 beds of vegetables in his garden, each being 12 ft. × 5 ft. How many sq. ft. in all the beds?

REVIEW—WRITTEN.

1. How many cu. in. in 36 cu. ft.?
2. How many cu. ft. in 691200 cu. in.?
3. How many cu. ft. in 428 cords?
4. How many cords in 64000 cu. ft.?
5. How many cu. inches in 1 cord?
6. How many lbs. in 17 tons?
7. How many cwt. in 25600 ounces?
8. How many tons in 598000 lbs.?
9. How many ounces in 3240 lbs.?
10. How many lbs. in 38 cwt.?
11. How many oz. in 2 T.?

12. How many seconds in the year 1887?
13. Reduce 5 A. 40 sq. rds. 28 sq. ft. to sq. ft.
14. How many cu. ft. in $36\frac{1}{2}$ cords?
15. How many more cu. in. in 480 bu. than in 480 gals., there being 2150 cu. in. in a bu. and 231 cu. in. in a gallon.
16. Cost of 8 bbls. 16 gals. oil at 20c. a qt.?
17. Profit on 50 bu. potatoes bought at 87c. per bu., sold at 30c. a peck?

18. How many miles, etc., in 18000 rods?
19. How many cu. ft. in 75894 cu. in.?
20. How many gals. in 47965 cu. in.?
21. How many T. in 794863 lbs.?
22. How many gals. in 156970 pts.?
23. How many bush. in 800 pts.? In 700 qts.?
24. How many cords in 9684 cu. ft.?
25. A cu. ft. of water weighs 1000 oz. How many lbs. in a cubic foot of water?

TABLE OF PARTS OF A DOLLAR.

$\frac{1}{2}$ dollar = 50 cents.	$\frac{2}{3}$ dollar = $66\frac{2}{3}$ cents.
$\frac{1}{3}$ dollar = $33\frac{1}{3}$ cents.	$\frac{3}{4}$ dollar = 75 cents.
$\frac{1}{4}$ dollar = 25 cents.	$\frac{2}{5}$ dollar = 40 cents.
$\frac{1}{5}$ dollar = 20 cents.	$\frac{3}{5}$ dollar = 60 cents.
$\frac{1}{6}$ dollar = $16\frac{2}{3}$ cents.	$\frac{4}{5}$ dollar = 80 cents.
$\frac{1}{8}$ dollar = $12\frac{1}{2}$ cents.	$\frac{3}{8}$ dollar = $37\frac{1}{2}$ cents.
$\frac{1}{10}$ dollar = 10 cents.	$\frac{5}{8}$ dollar = $62\frac{1}{2}$ cents.
$\frac{1}{12}$ dollar = $8\frac{1}{3}$ cents.	$\frac{7}{8}$ dollar = $87\frac{1}{2}$ cents.

1. How many cents in one half a dollar? In a quarter of a dollar?
2. How many cents in one eighth of a dollar? In $\frac{3}{8}$ of a dollar?
3. How many cents in $\frac{3}{4}$ of a dollar? In $\frac{5}{8}$ of a dollar?
4. How many cents in $\frac{1}{3}$ of a dollar? In $\frac{2}{3}$ of a dollar?
5. What part of a dollar is 50 cents? 25 cents?
6. What part of a dollar is 75 cents? $12\frac{1}{2}$ cents? $37\frac{1}{2}$ cents?
7. What part of a dollar is $62\frac{1}{2}$ cents? $87\frac{1}{2}$ cents? $33\frac{1}{3}$ cents? $66\frac{2}{3}$ cents?
8. Bought 3 bushels of oats at $\frac{1}{3}$ dollar a bu. Find the cost?
9. Henry buys 10 papers for $\frac{2}{10}$ dollar and sells them for $\frac{2}{8}$ dollar. What is his gain?
10. If a dozen pencils cost $\frac{3}{5}$ dollar, what is the cost apiece?
11. If an article costs $\frac{1}{12}$ dollar, what is the cost of three such articles?
12. Find the difference of $\frac{3}{4}$ dollar and $\frac{4}{5}$ dollar. Of $\frac{1}{6}$ dollar and $\frac{2}{3}$ dollar. Of $\frac{1}{8}$ dollar and $\frac{5}{8}$ dollar.
13. What is the cost of 8 lbs. of sugar at $\frac{1}{12}$ dollar a lb.?
14. At $\$\frac{2}{5}$ a day, what will a boy earn in a week?
15. How long will it take to earn \$2, at $\frac{1}{8}$ dollar a day?

1. How many yards in 255 rds. 3 yds.?
1. How many inches in 1375 yds. 2 ft. 7 in.?
3. How many rods in 17 mi. 38 rds.?
4. How many ft. in 28 mi. 45 rds. 3 yds.?
5. How many ft. in 3 mi. 5 fur. 23 rds. 11 ft.?
6. Find the number of ounces in 2 cwt. 45 lbs. 11 oz.?
7. Find the number of lbs. in 3 T. 412 lbs.?
8. Find the number of pts. in 37 gals. 2 qts. 1 pt.?
9. 47 bu. 3 pks. 2 qts. equal how many pts.?
10. 56 reams of paper equal how many sheets?

11. Reduce 3 wks. 4 da. 7 hours to min.
12. Reduce 365 da. 5 hr. 48 min. to min.
13. Reduce $285.37\frac{1}{2}$ to mills.
14. 35 score and 1 dozen equal how many units?
15. 13 bu. 1 pk. 7 qts. equal how many quarts?
16. Reduce 5 T. 75 lbs. 13 oz. to oz.?
17. 4 mi. 40 rd. 7 ft. are how many ft.?
18. A bbl. will fill how many $\frac{1}{2}$ pint bottles?
19. A hhd. will fill how many $\frac{1}{4}$ pint (gill) bottles?

20. 1 bu. (32 lbs.) oats equal how many 2 oz. packages?
21. 1 bu. (60 lbs.) wheat equal how many 4 oz. packages?
22. 1 bu. (56 lbs.) corn equal how many 3 oz. packages?
23. What is the weight of a load of oats of 54 bu.?
24. What is the weight of a load of wheat of 42 bu.?
25. What is the weight of 1 load of corn of 48 bu.?
26. Find the weight of 2 pails full of water, each holding $2\frac{1}{2}$ gals.
27. One pt. of water weighs about 1 lb. Find the weight of a load of water consisting of 6 bbls. full of water?
28. What is the weight of 45 bu. wheat and 65 bu. of oats.

FRACTIONS.

1. How many half dollars in one dollar?
2. If you lend me a $2 bill and I pay it back in half dollars, how many half dollars must I give you?
3. How many quarter dollars equal, in value, a $2 bill? A $4 bill?
4. I want to use 12 pieces of ribbon, each $\frac{1}{6}$ of a yard in length. How many yards will I need for that purpose?

Explain the following by using lines:

5. How many halves in 2? In 3? In 4? In 5?
6. How many thirds equal 2? 3? 4? 5? 6?
7. How many fourths in 2? In 3? In 5?
8. How many fifths in 2? In 3? In 8?
9. Express the number 4 in halves. In thirds. In fourths. In fifths.
10. How many half dollers in $2.50? In $3.50?
11. How many quarter dollars in $2.25? $2.50? $2.75? $3.25? $3.75? $4.50?
12. Express 2 in halves; 3 in halves; 4 in halves.
13. Express 2 in fourths; 3 in fourths.
14. Express 2 in thirds; 3 in thirds.
15. Two are equal to how many fifths?
16. How many eighths equal 1? 2?
17. How many sixths equal 1? 2?
18. 1 equals how many fourths? How many fifths? How many sixths?
19. 3 equals how many sixths? How many ninths?

1. How many bushels of potatoes, at 60c. a bu., are equal in value to 15 lbs. of coffee, at 28c. a lb.?

OPERATION: *15 times 28c. = 320c. 320c. ÷ 60 = 7.*

This work may be indicated by writing the factors of the divisor on the left, and those of the dividend on the right of a vertical line, and shortened by rejecting the common factors, as shown at the left. This method is called *cancellation.*

DIVISOR.	DIVIDEND.
60	15 3
12	28 7
3	
	7, Ans.

REMARK: *Since 5 is a factor of 60 and also of 15, it may be rejected from both, which leaves 12 in the place of 60 and 3 in the place 15. Again, since 4 is a factor of 12 and 28, it may be rejected, or* CANCELED *from both; also 3, being common to both divisor and dividend, is canceled. After all common factors have been canceled, divide the product of the factors remaining in the dividend by that of the factors remaining in the divisor.*

2. Divide $4 \times 6 \times 8 \times 10$ by $2 \times 3 \times 4 \times 5$.
3. Divide $5 \times 7 \times 9 \times 11$ by $3 \times 5 \times 7 \times 11$.
4. Divide $6 \times 8 \times 12 \times 18$ by $4 \times 6 \times 9 \times 12$.
5. Divide $9 \times 12 \times 15 \times 18$ by $6 \times 5 \times 9 \times 12$.

6. A gentleman purchased 24 lbs. of coffee, at 28c. a lb., and gave in payment 8 packages of sugar, each containing 7 lbs. What is the price per pound?
7. Bought 12 car loads of coal, each containing 32 tons, worth $6 a ton, and gave in payment 8 boat loads of flour, each containing 36 bbls. What is the cost per barrel?
8. A grocer exchanged 54 firkins of butter, each containing 48 lbs., at 25c. per lb., for 12 chests of tea, each containing 60 lbs. What is the price per lb. of the tea?

1. William has $\frac{4}{5}$ of a dollar, and Henry has $\frac{3}{5}$ of a dollar. How many fifths of a dollar have both?

   REMARK: $\frac{4}{5} + \frac{3}{5} = \frac{4+3}{5} = \frac{7}{5} = 1\frac{2}{5}$.

2. Mary learned her spelling lesson in $\frac{5}{8}$ of an hour, and her reading lesson in $\frac{7}{8}$ of an hour. In what time did she learn both lessons?
3. Find the sum of $\frac{5}{12}$, $\frac{3}{12}$ and $\frac{7}{12}$.
4. Mr. Adams bought $\frac{2}{3}$ of a ton of coal, and Mr. Bates bought $\frac{1}{3}$ of a ton of coal. How much coal did both buy?
5. James spent $\frac{3}{4}$ of a dollar on Monday, $\frac{1}{4}$ of a dollar on Tuesday, and $\frac{2}{4}$ of a dollar on Wednesday. How much did he spend in the three days?
6. John spends $\frac{2}{6}$ of a dollar for a slate, $\frac{4}{6}$ of a dollar for a book, and $\frac{1}{6}$ of a dollar for an eraser. How much did he spend?
7. Mr. C walks $3\frac{1}{2}$ miles in one hour, $4\frac{1}{2}$ in another, $3\frac{1}{2}$ in another. How many miles did he walk in the three days?
8. James earned $\frac{3}{4}$ dollar on Monday, $\frac{2}{4}$ dollar on Tuesday, $\frac{3}{4}$ dollar on Wednesday, $\frac{3}{4}$ dollar on Thursday. What did he earn in the four days?
9. I bought a book for $\frac{7}{11}$ of a dollar and sold it for $\frac{8}{11}$ of a dollar. Did I gain or lose, and how much?
10. A grocer sold $7\frac{3}{7}$ pounds of butter to one customer, $3\frac{5}{7}$ pounds to another, and $6\frac{6}{7}$ pounds to another? How much did he sell to all?
11. If you travel $87\frac{5}{12}$ miles in one day, $10\frac{3}{12}$ in another, and $12\frac{7}{12}$ in another, how far will you travel in all?
12. If a man buys 3 pieces of cloth, containing $25\frac{7}{8}$ yards, $50\frac{3}{8}$ yards, and $30\frac{2}{8}$ yards, how much will he then have?

1. How many cows, worth $24 each, can I get for 9 horses, worth $80 each?
2. How many tons of coal, at $7 a ton, are equal in value to 35 cords of wood, at $5 a cord?
3. I gave 15 sheep, worth $6 each, for hogs valued at $9 each. How many hogs did I receive?
4. Mr. Jenkins exchanged a farm of 160 acres, valued at $28 an acre, for 35 town lots. What was the average value of the lots?
5. How many yards of muslin, worth 12c. a yard, may be purchased for 16 lbs. of butter, at 15 cents a pound?
6. I gave potatoes, worth 75 cents a bushel, in exchange for 36 yards of carpet, worth $1.50. How many bushels of potatoes did I give?

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7. How many yards of cloth, at 40 cents a yard, are equal in value to 30 bushels of wheat, worth 88 cents a bushel?
8. Three pieces of velvet, containing 30 yards each, worth $5 a yard, were exchanged for 5 pieces of cloth, containing 45 yards each. What was the value of the cloth per yard?
9. How many cords in a pile of wood 60 ft. long, 12 ft. high, and 8 ft. wide?
10. How many cu. ft. in a box 72 in. long, 60 in. wide and 48 in. high?
11. A company of wood-choppers cut 18 piles of wood of 36 cords each, and exchanged it for 12 car loads of coal of 42 tons each, at $9 a ton. What is the price per cord of the wood?
12. I exchanged 28 horses, worth $115 each, for cows valued at $35 each. How many cows did I receive?
13. Divide $60 \times 36 \times 12 \times 35$ by $30 \times 7 \times 2 \times 15$.

1. Mary had $\frac{5}{8}$ of a dollar and spent $\frac{2}{8}$ of a dollar. How many eighths had she left?
2. Mr. B. owning $\frac{5}{9}$ of a factory sold $\frac{2}{9}$ of it. How many ninths had he left?
3. Mr. A. owned a lot containing $\frac{6}{7}$ of an acre. How much had he left after selling from it a lot containing $\frac{2}{7}$ of an acre?
4. If it takes John $\frac{8}{12}$ of an hour to learn his history lesson and $\frac{11}{12}$ of an hour to prepare his arithmetic lesson, which lesson takes longer time? How much?
5. Find the difference between $\frac{8}{11}$ and $\frac{5}{11}$.
6. How many fourths in $1\frac{3}{4}$? In $2\frac{1}{4}$?
7. I had $\$8\frac{3}{4}$ and spent $\$5\frac{1}{4}$. How much had I left?
8. James paid $\$1\frac{3}{4}$ for a book and $\$1\frac{1}{4}$ for a toy. How much more did the book cost than the toy?
9. Mr. Andre owned $\frac{5}{12}$ of a boat and sold $\frac{2}{12}$. What part of the boat has he left? What is that part worth if the boat is valued at \$7200.
10. A man owned $\frac{9}{10}$ of an establishment valued at \$6000. If he sells $\frac{1}{10}$, how much should he get for it? What is the remainder of his share worth?
11. Louis has $\$2\frac{1}{4}$; he earns $\$1\frac{1}{4}$ and spends $\$2\frac{1}{4}$. How much money has he then?
12. Mr. Simon has a lot containing $3\frac{2}{5}$ acres; he buys a lot containing $2\frac{4}{5}$ acres and then sells $1\frac{3}{5}$ acres. How many acres has he left?
13. Mr. Jordan sold $\frac{1}{5}$ of a mine for \$10000. What was the value of the mine? If he owned $\frac{3}{5}$ of it in the first place, what is the value of what he has left?
14. A piece of cloth contains 45 yds., $\frac{2}{5}$ was sold for \$2 a yd.; the remainder was damaged so that it was sold for \$1 a yd. How much was received for the entire piece?

1. Mr. Hale delivered a gallon of milk daily to his grocer in the month of May, for which he charged him 5 cents a quart. How many pounds of butter, at 26 cents a pound can he get in exchange for the milk?
2. A man bought six "eighties" (6 times 80 acres) of land. How many acres did he buy? If he paid $5000 for one half of it and $4600 for the other half, what did he pay for the whole?
3. What was the average cost per acre?
4. How much more would he have paid for the land had the average price been $40 per acre?
5. How many cubic feet of air in a room 18 ft. long, 15 ft. wide and 10 ft. high? How many cu. yds.?

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6. If a person breaths 18 times a minute and takes into the lungs 26 cu. in. of air at every breath, how many cu. ft. will he breath in 7 hours?
7. How many cu. in. does an audience of 100 people breathe in 1 hour?
8. If Mark earns $120 a month and spends $250 a year for board and $375 otherwise, how much less than $8000 does he save in nine years?
9. If two men start from Chicago, one going at an average of 35 miles a day, directly east, and the other 27 miles directly west, in how many days will they meet, provided the circumference of the earth is 25000 miles?
10. Mr. Duncan purchased 15 horses for $2000, 23 horses for $2750 and 27 horses for $3375. At what average price must he sell them to gain $1820?
11. $\frac{7}{9}$ of 144 acres, at $156.50 an acre, equals how much money? What is the remainder worth at $\frac{4}{5}$ of that price?

TABLE OF TROY WEIGHT.

24 grains (gr.) = 1 pennyweight (dwt.)
20 pennyweights = 1 ounce (oz.)
12 ounces = 1 pound (lb.)

Troy weight is used in weighing gold, silver and jewels.

1. How many grains in 2 dwt.?
2. How many dwt. in 72 grains?
3. How many oz. in 5 Troy lbs.? In 7 lbs.?
4. How many oz. in 100 dwt.? In 140 dwt.?
5. A man ordered a 3 oz. gold watch-case, but when it came it weighed only 57 dwt. How much did it fall short of the required weight?
6. If 1 grain of gold is worth 4 cents, what is the cost of 1 dwt. of gold? Of $\frac{1}{2}$ an oz. of gold?
7. What is the cost of an ounce of gold?
8. The gold and silver coins of the United States contain 9 parts, by weight, of pure metal, and 1 part alloy. What part of a gold dollar is gold?
9. What is the value of an ornament weighing 5 dwt., at $1.25 a dwt.?
10. How many dwt. in 240 grains?
11. What are $\frac{1}{2}$ doz. silver spoons, each weighing 3 oz., worth, at 40 cents an ounce?
12. Find the cost of a gold ring, weighing 4 dwt., at $1.05 a dwt.?
13. What is the weight in pennyweights of an ornament weighing 2 oz. 15 dwt.?
14. How many lbs. in 480 Troy ounces?
15. How many grains in a Troy ounce?
16. What is the value of $\frac{1}{2}$ an ounce of gold at $20 an ounce?

DIVISION OF U. S. MONEY.

1. Divide \$84.60 by 4.

$$4)\$84.60$$
$$\$21.15$$

REMARK: *When the division is exact, make as many decimal places in the quotient as there are in the dividend.*

Divide:

2. \$496.80 by 8.
3. \$729.54 by 9.
4. \$1260.75 by 15.
5. \$2448.96 by 24.

6. Divide \$37.375 by 5. (Three decimals in quotient.)

Divide:

7. \$69.625 by 9.
8. \$35.035 by 7.
9. \$844.284 by 42.
10. \$798.375 by 25.

11. Divide \$12.50 by 4.

$$4)\$12.50$$
$$\$\ 3.12\tfrac{1}{2}$$

or

$$4)\$12.500$$
$$\$\ 3.125$$

REMARK: *A remainder may be written as a fraction of a cent; or, ciphers may be annexed to the dividend, and the division continued. But, in such examples as these, in which the divisor is a whole number, there should be as many decimal places in the quotient as there are in the dividend, including the number of ciphers annexed.*

Divide:

12. \$84.36 by 8.
13. \$92.62 by 4.
14. \$87.15 by 2.
15. \$49.29 by 4.
16. \$76.27 by 5.
17. \$375.50 by 20.
18. \$480.75 by 25.
19. \$964.95 by 48.
20. \$450.48 by 16.
21. \$784.32 by 32.

REVIEW—ORAL.

1. How many cents in $\frac{1}{4}$ dollar? In $\frac{3}{5}$ dollar?
2. $\frac{1}{8}$ dollar equals how many cents?
3. What part of a dollar is $12\frac{1}{2}$ cents? $8\frac{1}{3}$ cents? $66\frac{2}{3}$c.?
4. How many quarts in a 2 bushel sack full of nuts?
5. 1 pk. 5 qts. 1 pt. equal how many pints?
6. 2 lbs. 8 oz. equal how many ounces?
7. 2 lbs. (Troy weight) 8 oz. equal how many ounces?
8. 5 yds. 2 ft. equal how many feet?
9. How many rods in 1 mi. 40 rds.?
10. How many feet in 2 rods?
11. How many inches in 1 yd. 1 ft. and 1 inch?
12. Two square feet are how many square inches?
13. What is the difference between 2 sq. ft. and 2 feet square?
14. How many square inches less in a $\frac{1}{4}$ square foot than in 1 square foot?
15. 9 sq. yds. equal how many square feet?
16. How many square feet in a piece of ground 30 ft. by 60 ft.?
17. What is it worth at $5 a sq. yd.?
18. How many days in a year and 3 weeks?
19. 72 in. equal how yards? How many feet?
20. How many yards in 66 ft.?
21. A tower is 240 ft. high. How many yards is that?
22. James' house is $\frac{1}{4}$ mile from the school-house. How far does he walk in going to and from school?
23. A room is 18 ft. wide and 20 ft. long. How many sq. ft. in the floor? How many in the ceiling?
24. How many sq. yds. in a crumb-cloth 3 yd. × 3 yd.?
25. What is it worth at 50c. a sq. yd.?
26. How many sq. yds. in a sq. rod?

REVIEW—WRITTEN.

1. How many cubic feet in a block of granite 8 ft. long, 4 ft. wide and 3 ft. thick?
2. If a cubic foot weighs 155 lbs. what is the weight of the block of granite?
3. How many sq. ft. in a walk 250 yds. long and 6 ft. wide?
4. Each side of a barn roof is 58 ft. long and from the eaves to the ridge of the roof 25 ft. wide. How many "squares" (each containing 100 sq. ft.) in both sides of the roof?
5. How many thousand shingles will it take to cover the roof, if 800 shingles cover a "square?"
6. What is the cost of the shingles, at $2.25 a thousand?
7. A railroad cut is 1215 ft. long, 16 feet wide, and 9 feet deep. How many cu. ft. of earth were excavated? How many yards? What was the cost at 28c. a cu. yd.?

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8. How many tons of coal, at $7 a ton, are worth 329 bbls. of flour, at $5 a barrel?
9. How many packages of coffee, each containing 5 lbs., at 27c. a lb., can be exchanged for 3 tubs of butter, of 54 lbs. each, at 24c. a lb.?
10. I exchanged 15 cords of wood, at $6 a cord, for 45 yards of cloth. What was the value of the cloth?
11. How many acres in 36 square miles of land?
12. A township contains 36 sq. mi. How many square miles in a county which contains 18 townships?
13. What is the land of such a county worth at $1.25 an acre? At $48.50 an acre?
14. A man owned $\frac{1}{2}$ of a mill valued at $5800; he sold $\frac{1}{3}$ of his share. What was it worth?

1. I sent a telegram, containing 22 words. The rate of charges was 25 cents for the first 10 words, and 2 cents for each additional word. What was the cost of the telegram?
2. If I go 5 miles on horseback while a train goes 20 miles, how many times as fast as I does the train go? How far does the train go, while I go 3 miles? How far do I go while the train runs 45 miles?
3. If I spend a half dollar a week for a car ticket, how much do I spend in 3 weeks? In 5 weeks?
4. What is the cost of 2 books, at $\frac{3}{4}$ dollar per book?
5. If I have a $\frac{1}{2}$ dollar and spend $\frac{1}{2}$ of that, what part of a dollar have I left?
6. If I cut an apple into 3 equal pieces, and take $\frac{1}{2}$ of one of those pieces, what part of the apple do I take?
7. If cloth is 48 cents a yard, what do I pay for $\frac{3}{4}$ yard? For $1\frac{1}{4}$ yard?
8. How many apples, at $\frac{1}{2}$ cent each, can be bought for 18 cents?
9. If 4 oranges are worth 3 cents, how many oranges are worth 12 cents?
10. If a $\frac{1}{4}$ pound package of candy costs 7 cents, what will $\frac{1}{2}$ pound package cost?
11. If $\frac{1}{2}$ an acre of land is worth \$60, what is the value of $\frac{1}{4}$ acre? Of $\frac{1}{8}$ acre?
12. What is the value of $\frac{1}{8}$ bbl. flour, if $\frac{1}{2}$ barrel costs \$2.40?
13. One half ton of coal sells for \$3.50. At that rate, what is 1 ton of coal worth?
14. One eighth cord of wood costs 80 cents. What is the value of $\frac{1}{2}$ cord at the same rate?
15. If $\frac{1}{9}$ bbl. of oil is worth 60c., what should be paid for $\frac{1}{6}$ barrel?

1. If 25 cows cost $1325, what will 275 cows cost at the same rate?
2. What must be paid for a car load of flour, consisting of 135 barrels, at the rate of 35 barrels for $166.25?
3. If 40 acres are worth $2280, what is a section of land worth at the same rate?
4. If a steamboat runs 240 miles in 24 hours, in how many days will she make the trip from New York to Liverpool, a distance of 3050 miles?
5. A drover bought 285 head of cattle for $13,680. What is the price of 118 of them?
6. If 13 men eat a wagon load of provisions in 90 days, how long will they last 39 men?
7. If it takes 15 men 78 days to build a house, how long will it take 13 men to do the same work?

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8. How long will the quantity of oats that 45 horses consume in 192 days last 96 horses?
9. If 18 tons of coal last a factory 126 days, how long will 145 tons last at the same rate?
10. If $\frac{1}{3}$ of a lot costs $245, what will 17 such lots cost?
11. If $\frac{1}{8}$ of a ton of feed costs $2.55, what will 36 tons of it cost?
12. If $\frac{3}{7}$ the cost of a house is $1770, what will it cost to build 14 such houses?
13. Seven men, sharing equally in the cost of erecting a building, paid $8745 each. What would have been each man's share of the cost had there been only 5 men in the company?
14. $\frac{5}{8}$ of a farm is worth $6240. What is $\frac{3}{4}$ of it worth?
15. $180 was the amount paid for 12 tons of hay At that rate what is the value of $\frac{1}{3}$ of a ton?

1. A boy's wages for 7 weeks are $63. What did he earn in a month (4 weeks)?
2. Of a pole 50 ft. long $\frac{1}{5}$ is under water. How many feet above water?
3. 9 is $\frac{1}{4}$ of what number?
4. 12 is $\frac{1}{3}$ of what number?
5. $18 is $\frac{1}{10}$ of the price of a shawl. What is the price of the shawl?
6. John, who is 15 years old, is $\frac{1}{2}$ the age of Henry. How old is Henry?
7. If $\frac{1}{5}$ of a ton of coal is worth $2, what is the price of 1 ton?
8. Mary spent 24 cents, which was $\frac{1}{2}$ of her money. How many cents had she at first?
9. James lost $\frac{2}{5}$ of his marbles, and then had 30 remaining. How many had he at first?
10. If 10 horses eat 5 bu. of oats a day, how many bu. will 8 horses eat in a week?
11. In how many days can 6 men cut 12 cords of wood, if 1 man cuts 4 cords in 2 days?
12. If 8 apples are worth 2 oranges, how many oranges can be purchased for 28 apples?
13. If I go 3 miles while the train goes 18, how far will the train run while I travel 9 miles?
14. If $\frac{1}{7}$ of the cost of a cow is $12, what is the whole cost?
15. I bought 9 sheep for $36, and the wolves killed $\frac{1}{3}$ of them. What was my loss?
16. Four boys own a boat, which cost them each $15. Another boy wishes an equal share in the boat with the four. How much ought he to pay the others?
17. How much will each of the four receive?
18. What is the cost of 3 chickens at the rate of 4 for $1? At the rate of 5 for $1?

1. Divide each of the following numbers by 2, and observe that there is no remainder:

   2, 4, 6, 8, 10; 12, 124, 1256.

2. Divide each of the following numbers by 2, and observe that there is always a remainder:

   3, 5, 7, 9; 13, 135, 1357.

   It can be proved that any number ending in 2, 4, 6, 8, or 0, and no other number, is divisible by 2.

   NOTE.—Divisible here means divisible without remainder.

3. Examine the products in multiplication table of 3's:

   3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36.

   Observe that when the product consists of two digits, the sum of the digits is divisible by three; as, in 12, the sum of 1 and 2, which is 3, is divisible by 3; in 27, $2 + 7 = 9$, which is divisible by 3.

4. Multiply any number by 3, and notice that the sum of the digits is divisible by 3. Thus, $3 \times 842 = 2526$; $2 + 5 + 2 + 6 = 15$, which is divisible by 3.

   It can be proved that any number, the sum of whose digits is divisible by 3, and no other number, is divisible by 3.

5. Which of the following numbers is divisible by 3?

   84, 921, 500, 1500, 370, 372, 428517.

6. Arrange the digits of the last number above, 428517, in several different orders; is each new number thus formed divisible by 3? Why?

7. Examine the products of 5, and of 10:

   5, 10, 15, 20, 25, 30, 35, 40, etc.
   10, 20, 30, 40, 50, 60, 70, 80, etc.

   What do you observe?

PRINCIPLES.

Make original problems and illustrate the following:

1. When the separate cost of several articles is given, how to find the entire cost.
2. When the sum of two numbers and one of them are given, to find the other.
3. Given the sum of three or more numbers, and the sum of all but one of them, to find that one.
4. Given two numbers, to find their difference.
5. How to find the greater of two numbers, when their difference and the less number are given.
6. How to find the less of two numbers when the greater and their difference are given.
7. Given the price of an article, to find the cost of any number of them at the same rate,
8. To find the dividend when the divisor and quotient are given.
9. Given a sum of money and the price of an article, to find how many can be bought for that sum, at the same rate.
10. How to divide a sum of money into a given number of parts.
11. How to divide a sum of money into parts, each containing a given number of dollars.
12. Given the product of two numbers and one of them, to find the other.
13. Given the product of three numbers and two of the numbers, to find the third.
14. If the divisor, quotient and remainder are given, to find the dividend.
15. If the dividend, quotient and remainder are given, to find the divisor.

REVIEW—ORAL.

1. Given the number 132, and 11 one of its factors, what is the other factor? Define the process by which you find it.
2. Show by giving an example what multiplication is.
3. A house is 24 ft. × 30 ft. How many square feet in its foundation?
4. How many cu. ft. in a wheat bin 10 ft. × 8 ft. × 7 ft.?
5. How many hours in April? How many less in February, 1887?
6. How many pieces of velvet, each half a yard long, can be cut from a piece $9\frac{1}{2}$ yards long?
7. I purchased a pint of milk for 3c. At that rate what is the cost of a gallon?
8. 1 dozen is what part of a gross? What part of a gross is 6 dozen?

REVIEW—WRITTEN.

1. A merchant bought 13 tubs of butter, containing on an average 52 lbs., at 26c. a lb., paying for it with 6 pieces of goods of 13 yards each. What was the cost of the goods per yard?
2. What must be paid for 42 rds. 3 yds. 2 ft. of iron fence at 75c. a foot?
3. How many cords of wood in a pile 60 ft. long, 4 ft. wide and 8 ft. high? What is the wood worth at $5.25 a cord?
4. How many acres in a field 140 rds. long and 80 rds. wide? What is it worth at $78 an acre?
5. I bought 18 reams of paper at $2.75 a ream, and sold it at 20c. a quire. How much did I gain?
6. Mr. Ames bought a ton of sugar at 5c. a lb., and sold it at $6\frac{1}{2}$c. a lb. Find the amount gained on the sugar, allowing $1.65 for freight?

Operations in United States Money.

1. Find the sum of each column.
2. Find the difference of what was received and what was paid

1. RECEIVED.	*2.* PAID.	*3.* RECEIVED.	*4.* PAID.
$247.85	$218.15	$1254.85	$1567.35
5.96	53.86	1249.84	863.65
10.00	27.89	294.85	567.43
8.13	5.06	2765.94	736.89
397.63	98.32	987.38	4643.94
142.15	314.18	3425.84	3265.93
16.85	57.62	2625.18	7268.47
2.63	3.27	999.80	1200.00
18.95	120.25	243.79	475.00
215.12	14.98	3956.55	363.89
32.98	25.00	8765.64	127.65
47.63	92.80	4763.87	98.45
3.85	87.63	544.65	381.15
215.12	254.85	1385.72	767.28
32.98	3.95	5238.18	5646.12

5. Henry DeLong's cash receipts for March were as follows: $4500, $50, $48.75, $85.35, $18.50, $25, $45.50, $446.14, $532.13, $513.68, $180, $39.39, $557. He paid bills as follows: $188.50, $250, $757.95, $74, $50, $79.85, $41.25, $134.14, $9.63, $2.65, 65c. How much has he on hand?
6. N. B. Hood bo't of Welch & Dean, Detroit, Mich., 10 doz. 2 Hoop Pails, @ $2, 3 doz. Tubs, @ $8.75, 2½ doz. Rolling Pins, @ $1.40, 2 doz. Wood Shovels, @ $7.50, 2 doz. Wringers, @ $45.50, 5 doz. Wash-boards, @ $1.75. He paid $18.50 in cash. How much does he still owe?

INTEREST.

1. I *borrowed* $400 of Mr. Gray to use one year. Ought I to use that money for nothing? If I pay him $6 on every hundred dollars for the use of it, how much ought I to pay him for $400? How much will I owe him at the end of the year?

$400 is called *principal.*

$24, the sum paid for the use of money, is *interest.*

$424, the sum of *principal* and *interest*, is the *amount.*

One year is the unit of time in finding, or computing, interest.

$6 paid for the use of $100 one year is $\frac{6}{100}$ of the principal, and means six *for every hundred*, or 6 *per cent.*

Instead of the words *per cent* this sign, %, is used.

2. What is the interest at 6%, of $200 for one year? Of $300?
3. What is the interest at 5%, of $100 for one year? Of $500?
4. Find the interest of $200 for one year, at 7%? 8%? 10%?
5. Find the amount of $100 for one year, at 6%? 5%? 9%?
6. Find the interest of $100 for two years, at 6%; for 3 yrs.
7. Find the interest of $300 for two years, at 5%; for 4 yrs.
8. What is the interest, at 6%. of $100 for $1\frac{1}{2}$ yrs.? $2\frac{1}{2}$ yrs.?
9. What is the interest, at 6%, of $200 for 1 yr. 6 months?
10. What is the interest, at 6%, of $400 for $2\frac{1}{3}$ years?
11. What is the interest, at 6%, of $500 for 2 yrs. 8 mos.?
12. At 6%, what is the interest for one year on $1? $2? $5? $8? $10? $20? $50? $70?
13. At 6%, what is the interest of $1 for $1\frac{1}{2}$ yrs.? For $1\frac{1}{3}$ yrs.? For $1\frac{2}{3}$ yrs.? For $2\frac{1}{2}$ yrs.? For $5\frac{2}{3}$ yrs.?
14. At 8%, what is the interest of $2 for $1\frac{1}{4}$ yrs.? For $2\frac{3}{4}$ yrs.? For 4 yrs.? For $10\frac{1}{2}$ yrs.?

VALUE OF PER CENTS IN DECIMALS.

6% = .06	$\frac{3}{4}$% = .0075	$8\frac{3}{8}$% = .08375
$2\frac{1}{2}$% = .025	$3\frac{1}{5}$% = .032	$\frac{5}{8}$% = .00625
$5\frac{1}{4}$% = .0525	$7\frac{1}{8}$% = .07125	$6\frac{7}{8}$% = .06875

1. What is the interest of \$345 for 1 year, at 6%?

REMARK: *6% = .06, \$345 × .06 = \$20.70, interest for one year. How much would the interest be for 2 yrs.? $3\frac{1}{2}$ yrs.?*

PROCESS:
\$ 345, Principal.
.06, Rate per cent.
\$20.70, Interest.

2. What is the interest of \$128.75 for one year, at 7%?

REMARK: \$128.75 × .07 = \$9.0125, *or* \$9.01$\frac{1}{4}$. *In the product there are as many orders of figures to the right of the* DECIMAL POINT (.) *as there are to the right of the decimal points in both of the factors.*

PROCESS:
\$128.75
.07
\$9.0125

What is the interest of

3. \$80 for 1 year, at 8%?
4. \$50 for 2 years, at 4%?
5. \$900 for 3 years, at 7%?
6. \$300 for 5 years, at 9%?
7. \$10 for 4 years, at 6%?
8. \$7.50 for 4 years, at 5%?
9. \$12.50 for 2 years, at 8%?
10. \$50 for 2 years, at $7\frac{1}{2}$%?
11. \$30 for 3 years, at $5\frac{1}{3}$%?
12. \$3 for 8 years, at $12\frac{1}{2}$%?
13. What is the interest of \$30 for 1 yr. 4 mos., at 9%?

PROCESS: \$30 × .09 + $\frac{1}{3}$ (\$30 × .09) = \$3.60.

14. What is the interest of \$60 for 1 yr. 3 mos., at 6%?
15. What is the interest of \$400 for 2 yrs. 6 mos., at 10%?
16. What is the interest of \$900 for 3 yrs. 2 mos., at 6%?

WRITTEN.

1. Find interest of \$240 for 3 years 7 months, at 8%.

REMARK: \$240 × $\frac{8}{100}$ = *interest for 1 year. This result, divided by 12, gives the interest for 1 month, which, multiplied by 43 mos.* (3 *yrs.* 7 *mos.* = 43 *mos.*) = \$68.80. *Place the divisors on the left of the vertical line and cancel the common factors.*

PROCESS:

	~~20~~
5	~~\$240~~
~~100~~	8
~~12~~	43
5	344.00
	\$68.80

2. Find interest of \$360 for 2 yrs. 5 mos., at 6%.
3. Find interest of \$600 for 3 yrs. 11 mos., at 8%.
4. Find interest of \$720 for 1 yr. 9 mos., at 8%.
5. Find interest of \$480 for 3 yrs. 6 mos., at 10%.
6. Find interest of \$90 for 4 yrs. 5 mos., at 6%.
7. Find interest of \$72 for 5 yrs. 3 mos., at 8%.
8. Find interest of \$418 for 18 days, at 6%.

REMARK: *Divide interest for 1 month by 30, to obtain the interest for 1 day. Annex three 0's to carry the quotient out to mills.*

PROCESS:

100	\$418
12	6
30	18
500	627.000
	\$1.254

9. Find interest of \$300 for 20 days, at 8%.
10. Find interest of \$450 for 19 days, at 10%.
11. Find interest of \$1200 for 16 days, at 7%.
12. Find interest of \$1500 for 25 days, at 9%.
13. Find interest of \$840 for 7 months 21 days, at 6%.

REMARK: 7 *mos.* 21 *days* = 231 *days.*

14. Find interest of \$340 for 5 mos. 24 days, at 8%.
15. Find interest of \$800 for 9 mos. 15 days, at 4%.
16. Find interest of \$140 for 7 mos. 12 days, at 5%.

1. Find interest of \$600 for 5 yrs. 3 mos. 11 days, at 5%.

   REMARK: \$600 × .05 × 5 = *int. for* 5 *years. Then by cancellation find the int. for* 3 *mos. and* 11 *days, and add it to that of* 5 *yrs.*

2. \$960 for 2 yrs. 8 mos. 7 days, at 10%.
3. \$1440 for 3 yrs. 5 mos. 15 days, at 9%.
4. \$60 for 2 yrs. 3 mos. 20 days, at $7\frac{1}{2}$%.
5. \$1200 for 4 yrs. 6 mos. 5 days, at $4\frac{1}{2}$%.
6. \$195 for 8 yrs. 1 mo. 3 days, at $6\frac{1}{4}$%.
7. \$180.75 for 1 yr. 2 mos. 10 days, at 6%.
8. \$47.60 for 2 yrs. 3 mos. 18 days, at 7%.

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9. Find the amount of \$325.50 for 4 yrs. 6 mos. 15 days, at 6%.

   REMARK: *Observe the decimal point in cancelling and in the product.*

10. Find the amount of \$480.90 for 3 yrs. 9 mos. 10 days, at 8%.
11. I bought a lot for \$800, and after 2 yrs. 6 mos. I sold it for \$1200. What was the gain, if money was worth 10%?
12. What amount of money will pay a note of \$500, due in 3 yrs. 6 mos. 20 days, at 10%?
13. I loaned Mr. Jones \$800, which he returned in 8 mos. 10 days, with 8% interest. What did he pay me?
14. What is the annual income from an investment of \$10000, which pays $8\frac{1}{2}$%?
15. What is the amount of \$1236 for 3 months and 14 days, at 7 per cent?
16. What is the interest of \$1400 for 1 year, 1 month and 9 days, at 7 per cent?

1. Gave my note Nov. 9, 1886, for $965.48, payable March 12, 1888, with interest at 9%. How much will discharge the debt at the latter date?

REMARK: *From Nov. 9, 1886, to Nov. 9, 1887, is one year; from Nov. 9 to March 9 is 4 mos., and from the 9th to the 12th of March is 3 days. Therefore, the time the money is on interest is 1 yr. 4 mos. 3 days.*

2. At 6 per cent, what is the interest of $469.60 from August 10th, 1886, to Feb. 6th, 1887?

3.

$450.00. *Chicago, Oct. 15, 1886.*

Ninety days after date, for value received, I promise to pay A. B. Duncan, or order, Four Hundred Fifty Dollars, with interest at 6 per cent. *Charles Manning.*

4.

$725.00. QUINCY, ILL., Aug. 20, 1887.

Two years from date, we promise to pay to the order of Frank Barber, Seven Hundred Twenty-five Dollars, for value received, with interest at 8 per cent.

L. G. MORE,
SIMON DUNN.

DAY BOOK.

Peru, Ill., April 5, 188?.

Ledger Page.		$	¢	$	¢
281	A. A. Patterson Dr.				
	To 5 bbls. Flour, @ $5.35			.....	.....
	12				
281	Geo. Quinn, Dr.				
	To 8 bu. Potatoes, @ 75¢	.....	.....		
	" 15 lbs. Coffee, @ 28¢	.....	.....	.....	.....
	15				
281	A. A. Patterson, Cr.				
	By Cash			12	50
	22				
281	A. A. Patterson, Dr.				
	To 25 lbs. Sugar, @ 8¢			.....	.....
	By Cash, ... Cr.			1	50
	28				
281	Geo. Quinn, Cr.				
	By 2 days' Labor @ $2.50			.....	.....

LEDGER.

Dr. — A. A. Patterson. — Cr.

1887.			Day B'k Page.	$	¢	1887.			Day B'k Page.	$	¢
Apr.	5	To Mdse.	250	26	75	Apr.	15	By Cash.	250	12	50
"	22	" "	250	2	00	"	22	" "	250	1	50
						"	30	" Balance		14	75
				28	75					28	75

Dr. — Geo. Quinn. — Cr.

1887.			Day B'k Page.	$	¢	1887.			Day B'k Page.	$	¢
Apr.	12	To Mdse.	250	10	20	Apr.	28	By Labor,	250	5	00
						"	30	" Balance		5	20
				10	20					10	20

NOTE.—The Ledger contains each man's account by itself. The "Dr." side is what he owes, and the "Cr." side what he has paid. The Balance is what he still owes.

APPENDIX.

TABLES OF WEIGHTS AND MEASURES.

1. LINEAR MEASURE.

12 inches (in.)	= 1 foot (ft.)
3 feet	= 1 yard (yd.)
$5\frac{1}{2}$ yards $16\frac{1}{2}$ feet	= 1 rod (rd.)
320 rods 5280 feet	= 1 mile (m.)

2. SQUARE MEASURE.

144 square inches (sq. in.)	= 1 square foot (sq. ft.)
9 square feet	= 1 square yard (sq. yd.)
$30\frac{1}{4}$ square yards	= 1 square rod (sq. rd.)
160 square rods	= 1 acre (A.)
640 acres	= 1 square mile (sq. m.)

3. CUBIC MEASURE.

1728 cubic inches (cu. in.)	= 1 cubic foot (cu. ft.)
27 cubic feet	= 1 cubic yard (cu. yd.)
$24\frac{3}{4}$ cubic feet	= 1 perch of stone or masonry.
128 cubic feet	= 1 cord (cd.)

4. LIQUID MEASURE.

4 gills (gi.)	= 1 pint (pt.)
2 pints	= 1 quart (qt.)
4 quarts	= 1 gallon (gal.)
$31\frac{1}{2}$ gallons	= 1 barrel (bbl.)
63 gallons (2 bbls.)	= 1 hogshead (hhd.)

NOTE.—1 gallon = 231 cu. in. Practically, $7\frac{1}{2}$ gallons = 1 cu. ft

5. DRY MEASURE.

2 pints (pts.)	= 1 quart (qt.)
8 quarts	= 1 peck (pk.)
4 pecks	= 1 bushel (bu.)

NOTE.—1 bushel = 2150 4 cu. in ; or (practically), $\frac{4}{5}$ cu. ft., *i. e.*, $\frac{4}{5}$ of the cu ft in a bin = the number of bushels.

6. AVOIRDUPOIS WEIGHT.

16 ounces (oz.)	= 1 pound (lb.)
100 pounds	= 1 hundredweight (cwt.)
20 hundredweight 2000 pounds	= 1 ton (T.)
1 pound	= 7000 grains.

7. TROY WEIGHT.

24 grains (gr.)	= 1 pennyweight (dwt.)
20 pennyweights	= 1 ounce (oz.)
12 ounces	= 1 pound (lb.)
1 pound	= 5760 grains.

TABLES OF WEIGHTS AND MEASURES—*Continued.*

8. APOTHECARIES' WEIGHT.

20 grains (gr.) = 1 scruple (sc. or ℈).
3 scruples = 1 dram (dr. or ʒ).
8 drams = 1 ounce (oz. or ℥).
12 ounces = 1 pound (lb. or ℔).
1 pound = 5760 grains.

9. UNITED STATES MONEY.

10 mills (m.) = 1 cent (ct., c. or ¢).
10 cents = 1 dime (d.)
10 dimes (100 cents) = 1 dollar ($).
10 dollars = 1 eagle.

10. ENGLISH MONEY.

4 farthings (far.) = 1 penny (d.)
12 pence = 1 shilling (s.)
20 shillings = 1 pound (£).
£1 = $4.8665.

11. TABLE OF TIME.

60 seconds (sec.) = 1 minute (m.)
60 minutes = 1 hour (h.)
24 hours = 1 day (d.)
7 days = 1 week (wk.)
30 days = 1 month (mo.)
365 days, 12 months, 52 weeks 1 day = 1 year (yr.)
100 years = 1 century (C.)
366 days = 1 leap year.

12. MISCELLANEOUS.

24 sheets = 1 quire.
20 quires = 1 ream.
10 reams = 1 bale.
12 units = 1 dozen.
12 dozen = 1 gross.
12 gross = 1 great gross
20 units = 1 score.

13. POUNDS IN A BUSHEL.

60 lbs. wheat = 1 bushel (bush. or bu.)
32 lbs. oats = 1 bushel.
56 lbs. shelled corn = 1 bushel.
70 lbs. corn in ear = 1 bushel.
56 lbs. rye = 1 bushel.

14.

1 size = ⅛ inch (shoemakers' measure).
1 hand = 4 inches (height of horses).
1 fathom = 6 feet (depth of sea).
1 furlong = 40 rods.
1 rod = 5 paces.
1 quintal of fish = 100 lbs.
1 barrel of flour = 196 lbs.
1 barrel of pork or beef = 200 lbs.
1 keg of nails = 100 lbs.

DEFINITIONS.

1. A **Unit** is a single thing, or one of a kind.
2. A **Number** is a unit or a collection of units.
3. **Figures** are characters used to represent numbers.
4. A **Digit** is any of the figures except 0.
5. **Notation** is an expression of number by figures or letters.
6. **Numeration** is naming numbers written in figures or letters.
7. The **Factors** of a number are those numbers whose product is that number.
8. An **Abstract Number** is a number which does not represent any particular object or objects.
9. A **Concrete Number** represents objects or quantity.
10. A **Prime Number** is a number that cannot be divided by any other number except itself and one.

ADDITION.

1. **Addition** is a process of finding the sum of two or more numbers of the same kind.
2. The **Sum**, or **Amount**, is the number that contains as many units as two or more given numbers.

SUBTRACTION.

1. **Subtraction** is a process of taking part of a number away to find what remains.

   Subtraction is also a process of finding the difference of two numbers. (See page 141.)
2. The **Minuend** is the number to be diminished, or the number with which another is to be compared.
3. The **Subtrahend** is the number to be taken out of the Minuend, or the number to be compared with the Minuend.
4. The **Remainder** is the result obtained by subtraction.

MULTIPLICATION.

1. **Multiplication** is a short process of finding the amount of two or more equal numbers.
2. The **Multiplicand** is one of the equal numbers to be added.
3. The **Multiplier** is the number which shows how many equal numbers are to be added.
4. The **Product** is the result obtained by multiplication.

DIVISION.

1. **Division** is a process of finding how many times one number is contained in another; or, a process of separating a number into equal parts. (See page 164.)
2. The **Dividend** is the number to be divided.
3. The **Divisor** is the number by which the Dividend is to be divided.
4. The **Remainder** is that part of the Dividend remaining undivided.

FRACTIONS.

1. An **Integer,** or **Integral Number,** is a number that expresses whole units.
2. A **Fraction** expresses one or more of the equal parts of a unit.
3. A **Decimal Fraction** is a fraction in which the unit is divided into tenths, hundredths, thousandths, etc.
4. A **Common Fraction** is a fraction in which the unit is divided into any number of equal parts.
5. A **Fractional Unit** is one of the equal parts into which a unit is divided.
6. The **Terms** of a fraction are the Numerator and Denominator.
7. The **Denominator** (Namer) of a fraction indicates the name, or size, of each of the parts into which the unit is divided.
8. The **Numerator** (Numberer) shows how many of the fractional units are expressed by the fraction.
9. A **Proper Fraction** is a fraction whose numerator is less than its denominator.
10. An **Improper Fraction** is a fraction whose numerator is equal to or greater than its denominator.
11. A **Simple Fraction** is a fraction whose terms are integers
12. A **Mixed Number** is composed of an integer and a fraction.
13. **Reduction** of fractions is changing their form without changing their value.

MEASURES.

1. The **Dimensions** of an object are its length, breadth and thickness, or height.
2. A **Line** has the dimension of length only.
3. A **Surface** has the dimensions of length and breadth.
4. A **Solid** has the dimensions of length, breadth and thickness, or height.
5. An **Angle** is the difference of direction between two lines.
6. A **Right Angle** is one of the four equal angles formed by the intersection of two straight lines.
7. A **Rectangle** is a surface bounded by four straight lines which form four right angles.

MEASURES—*Continued.*

8. A **Square** is a surface bounded by four equal straight lines which form four right angles.
9. A **Cube** is a solid bounded by six equal squares.
10. The **Square of a Number** is the product of the number used twice as a factor.
11. The **Cube of a Number** is the product of the number used three times as a factor.
12. **Area** is surface expressed in square units.
13. **Reduction Ascending** is changing numbers, by division, from a lower to a higher denomination.
14. **Reduction Descending** is changing a number, by multiplication, from a higher to a lower denomination.

PERCENTAGE.

1. **Per Cent** means *hundredths*. The sign of per cent is %.
2. The **Rate** is the number of hundredths indicated.
3. The **Principal** is the sum of money for the use of which interest is paid.
4. **Interest** is the sum paid for the use of money.
5. The **Amount** is the sum of the principal and the interest.